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# **Using social learning environments to leverage traditional supervision of research students: A Community of Practice Perspective**

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**A minor dissertation submitted in part fulfillment of the requirements for the award of  
a Master of Philosophy(MPhil) in Information and Communication  
Technologies(ICTs) in Education**

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**BY**

**SHEPHERD MLAMBO**

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**SUPERVISOR:**

**ASSOCIATE PROFESSOR DICK. NG'AMBI**

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Lastly, I express my gratitude to the Almighty. All was just possible because He is the only one who was beside me 24/7 for the duration of the study.

**God Bless!!**

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## Abstract

South African higher education is plagued by student articulation gap, which is often attributed to insufficient knowledge production processes and surface approaches to learning. Unfortunately, supervisor-student model of supervision, one of the direct, personal interventions to address this challenge, is plagued by multiple flaws.

The traditional supervisor-student model of knowledge generation may not be adequate in externalizing research processes to students. Yet, a social learning model potentially extends the traditional model by providing a social environment where students collectively generate knowledge through peer-based interactions. Mindful of supervision dilemmas namely, supervisors' publication pressure, multiple supervisory sessions, limited supervisor-student interactions, complexity of capturing supervision proceedings (listening and engaging simultaneously) (except when audio recorded), this study explores technology-enhanced social learning environments as complements to traditional supervision models.

The study investigates the potential of technology-enabled social learning environments to externalize and render explicit generic research processes for novice researchers as they interact via these research environments. To explore this problématique, Community of Practice (CoP) and interpretivism are employed as a theoretical and methodological lens for exploring the social learning that unfolded amongst novice researchers (postgraduates) in a technology-mediated social research community.

To interrogate research dynamics in a social research community, a prototype of an informal online CoP, a Knowledge Audio Repository (KAR), served as an intervention for generating, capturing and examining postgraduate students' understanding of complex research processes and social learning. The research examined student postings on the KAR, opened in-depth interviews and questionnaires to generate a holistic understanding of the capacity of online social research communities to complement traditional supervision methods. CoP constructs were harnessed for exploring students' experiences of conducting research.

Seven (7) postgraduate students at various stages of their studies (master's and doctoral) participate in this study. They were located on three South African universities and came

from different academic disciplines. The geographical dispersion of students enhanced the evaluation of the social learning environment (SLE)'s potential to leverage traditional supervision models.

The findings suggest that students significantly relied on an informal social environment for learning research processes. For these postgraduate students, social interaction proved critical to their situated learning, peer-based collaboration and resource sharing. KAR reportedly extended research-based interactions and knowledge creation beyond locales, and the sharing of research experiences by novice researchers at both the individual and group or community levels. The study also reports student acquisition of hidden research skills through the sharing of experiences. The study recommends that tertiary institutions explore social environments as productive spaces for postgraduate earning of research process skills.

University of Cape Town

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# Chapter 1: Introduction

## 1.1 Introduction

South African universities are confronted with the twin challenges of insufficient knowledge production processes and limited student academic engagement. Paradoxically, traditional supervisor-student model of supervision, personal interventions that potentially redeem these institutions from these challenges are fraught with pitfalls.

The traditional supervision method follows a closed mentoring model of a “*supervisor-student dyad working intensively on scholarly and research endeavours*” (Brad, 2001, p. 1). This face-to-face model, which is often sandwiched with online engagement, tends to exclude a broader social learning environment (SLE) as graduate supervision is an exclusively personal engagement process. This closed intellectual enterprise undergirds a more knowledgeable academic mentor providing support and knowledge to a novice who acquires more experience in a profession over time (Brad, 2001). This closed system potentially forecloses opportunities for learning from and within the broader social environment. For instance, social environments allow researchers’ free exchange of information, which is critical to the process of conducting a social science research (Lim & Hang, 2003). Therefore, social environments provide serendipitous conditions for social learning, which may be absent in traditional supervision methods. This study investigated the capacity of online learning environments to provide ideal contexts for postgraduate students to conduct research in ways that complement tradition supervision.

This chapter is structured as follows: It first provides a research background, highlights problems often experienced by novice researchers in their research processes; research questions that guide this study, and the rationale for conducting the study. A proposed framework concludes this chapter.



## 1.2 Limitations of the traditional supervision method

Traditional supervision methods are constrained by the following factors: time and space, distance between location of students and supervisors, supervisors' availability, and increased enrolment in research programmes. These factors have exposed the limitations of traditional supervision methods which are mainly student-supervisor dyads.

Interactions between supervisors and their students usually occur during specified times and at agreed upon locations, usually in the supervisor's office. In relation to time is the availability of the supervisor to attend to supervision duties: In addition to supervision of research students, supervisors attend to facilitation of seminars and some of their time is spent doing their own research work. Distance adds to the factors affecting traditional supervision when supervisor and student are located far apart. In addition to the stated constraints, is the limitation of sharing research process knowledge by the student-supervisor dyad, which the researcher views as a kind of '*closed mentoring model*'. Interaction and knowledge shared is limited to only the two individuals. This tends to exclude ideas from other experienced researchers in a broader social learning environment (SLE), besides the two involved.

The outlined supervision limitations rationalises the need by both the student and student to look at other options of interactions and of facilitating the success of the supervision process. Several technologies have capabilities that may be used to enable interaction between supervisor and student, and enhance knowledge sharing by extending the supervision facilitation to an open community of researchers, thus possibly mitigating the stated limitations. The proliferation of Internet technologies has enabled phenomenal growth of online social interaction amongst individuals located anywhere on the globe. Social research environments often, emphasise learning research processes, provide structure for social learning where learners reflect, share their experiences, and construct new meaning through social exchanges (Wenger & Snyder, 2000).

The study used a customised online social research environment prototype named a Knowledge Audio Repository (KAR) that was setup to facilitate interaction and collect

evidence of research dialogs amongst participants. Such a customised environment allowed the researcher to be able to access and harvest evidence of all activity.

This study investigated the capacity of online learning environments to provide ideal contexts for postgraduate students to conduct research in ways that complement tradition supervision.

### 1.3 Nature of research processes in social environments

While academic research is often credited for extending knowledge boundaries (Tress., Tress, & Fry, n.d.), acquiring research skills is an inexorably complex endeavour. Research implies “*a systematic investigation and study of phenomena, in order to establish facts and reach conclusions*” (Oxford Dictionary, 2001).

In this study, ‘knowledge’ means tacit (implicit) and explicit forms of knowing that characterise perception (Paavola, Lipponen, & Hakkarainen, 2004). Individual’s innate abilities or skills constitute tacit knowledge (Tee & Karney, 2010), and explicit knowledge is objectifying tacit knowledge; a way of making tacit knowledge more tangible by externalising it (Bereiter, 2002). Published research studies and articles, research objects that may further be acted on are examples of explicit knowledge. This current work defines knowledge as both *tacit* abilities of an individual that may not be directly accessible to others, and the *explicit* form, which is objective knowhow that can be expressed in words (Nonaka, Toyama, & Konno, 2000).

The challenge of using research to extend knowledge boundaries is that research processes underscore complex processes of transforming tacit knowledge in individuals into explicit knowledge shareable with colleagues. Therefore, the conduct of research is a transformative process in which researchers interact with explicit objects in a social environment, and acquire new tacit knowledge through research activities. Through research, individuals gain new understanding that impact on the interpretation of outcomes (Nonaka, et al., 2000; Paavola, Lipponen, & Hakkarainen, 2004).

Thus, knowledge building is a collective, intellectual activity that demands a social environment that includes peers and knowledgeable individuals (Boud & Lee, 2005). Yet

traditional research supervision unfolds in confined environments that constrain social learning and meaningful interaction as discussed in Section 1.6. On the contrary, social research environments often, emphasise learning research processes, provide structure for social learning where learners reflect, share their experiences, and construct new meaning through social exchanges (Wenger & Snyder, 2000). If social learning occurs as learners conduct research, is therefore, an “*inseparable part of social practice*” (Lave & Wenger, 1991, p. 32). Therefore, social environments extend traditional supervision methods by providing sharing of knowledge platforms and development of research process skills by learners.

## 1.4 Metaphors on new knowledge creation

Sfrad (1998) suggests two metaphors on the genesis of new knowledge: *acquisition* and *participation*. Acquisition is a learning process where appropriation of knowledge depends on a learner’s ability to gain and construct knowledge, and apply it in new conditions. This metaphor rooted in cognition problematically treats the mind as a container to be filled with knowledge.

Participation metaphor foregrounds individual involvement in cultural practices and other shared social activities. It emphasises the knowledge creation activities and not necessarily the product, which is knowledge. Knowledge is viewed as not residing in the mind but is distributed in social processes and thus constructed through distributed social activities (Paavola, et al, 2004).

Traditional supervision methods gravitate towards acquisition where supervisors impart knowledge with little talk back processes. This study proposes a participation metaphor where students learn through active involvement in and belonging to social learning communities where knowledge is co-constructed.

## 1.5 Study Assumptions

### 1.5.1 The participatory nature of learning

Graduate research students are novice researchers undertaking various research studies at graduate level. Student researchers are new entrants to their research field with limited research knowledge. As such, social interaction is core to their learning path/trajectory to become seasoned researchers (Brook & Oliver, 2003). They must have dispositions to participate in dialogues of research practice to acquire research skills (Cassidy, et al., 2008). The entire research process: research topic formulation, problem formulation, hypothesis testing, literature review, selection and design of appropriate research methodologies, developing instruments, analysis of evidence, and report compilation, lends themselves to social learning in participatory environments.

### 1.5.2 Asymmetrical power in traditional supervision modes

Traditional supervision methods based on academic-student face-to-face conversations inadequately exploits contemporary learners' academic potential, fails to recognise students' time constraints and attention spans (Oblinger, 2006). Traditional supervision methods tend to promote a hierarchical relationship between the supervisor and student, where students acquire knowledge from authoritative figures in the subject matter (Armstrong, Allinson, & Hayes, 2004). Such environments may constrain student self-expression due to social distance<sup>1</sup>. In contrast, social environments (campus cafés and canteens, coffee shops, lounges, and open grounds on and off campus) are informal learning spaces where peers and knowledgeable researchers interact and share research ideas.

### 1.5.3 Emerging technologies' extension of spatial and temporal dimensions of learning

Digital technologies afford learners to learn in virtual spaces. The availability of digital devices, networks and Internet technologies enable synchronous and asynchronous ubiquitous access

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<sup>1</sup> Additional pitfalls related to the traditional supervision methods are discussed in Section 1.6

to virtual learning spaces anytime and anywhere (Brown, 2005). Brad (2001) proposes '*vertical team model*,' a training model, where a supervisor leads a fairly large group of students in research-oriented regular meetings. Instead of spreading his/her knowledge across many subject areas, he/she specialises in supervising in narrowed specialities. With Brad's '*vertical team model*', learning through socialisation improved compared to the supervisor-student dyad. However, the model was plagued by challenges, which are related to traditional supervision method discussed below.

## 1.6 Problems identified in traditional research processes

### 1.6.1 Knowledge losses and need for continuity

Novice researchers tend to rely on research publications, ideas, claims and insights from experienced researchers (Engestrom, 1999). When conducting research, learners interact with other researchers, mentors, the community, the subject of study, and domain content to learn from each other's experiences and sharing historic tacit knowledge acquired over years of practice. Despite numerous knowledge exchanges in these isolated engagements, the reification of such knowledge manifests in what researchers incorporate in their publications. Unspecified explicit knowledge<sup>2</sup> excluded from published reports may be permanently lost from the educational and research fraternity. Future researchers will not benefit from such material that remains as tacit knowledge possessed by researchers when they retire leaving a knowledge chasm. Preserving this knowledge can benefit research community through the sharing, enriching, and its dissemination as explicit knowledge.

### 1.6.2 Limited realisation of learners' multiple perspectives

Learners construct knowledge based on research suppositions and their accumulated prior personal experiences. These suppositions are continuously tested through social negotiations where learners perceive, interpret and construct knowledge differently (Kass, et al., 1994). Thus, each learner mentally constructs knowledge according to the way he/she is socialised in

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<sup>2</sup> see Section 2.3 in Chapter 2 for a discussion on explicit knowledge

his/her environment. The absence of formal structures for channelling and preserving these diverse perceptions and interpretations means that they are potentially lost over time.

### 1.6.3 Complicated research-mentoring model(s)

Mouton and Waast (2009) report a supervision crisis in developing countries characterized by the freezing of senior academic positions, brain drain, and retirement of senior professoriate. Even if supervisors were adequate, the quality of mentoring needs improvement because of limited expertise in various sub-research domains and inadequate supervision time. More so, institutional policies often emphasise research productivity more than teaching and supervision, thus sparing less time for mentoring and supervision (Brad, 2001). The “*publish or perish*” approach at South African HEIs perceivably rewards research publication, and pays down becoming great mentors

### 1.6.4 Massification of higher education

Enrolment in colleges and universities is rising (Bronack, Sanders, Cheney, Riedl, Tashner, & Matzen, 2008). The increasing numbers of research students exacerbate mentoring and supervision challenges. The student-to-supervisor ratio is growing and supervisors may not cope (Brad, 2001). The heterogeneous research knowledge and experiences of students enrolled at university require varying levels of mentorship which academics naturally cannot meet.

### 1.6.5 Disjointed disciplines

‘Disjoint disciplines’, manifest in “*discipline[s] [that are] splintered into niches of expertise without unifying theoretical stances*” (Youniss, 2006, p. 315). Cross-fertilisation of knowledge amongst disciplines is limited. As a result, there is inadequate knowledge enrichment as some niches are not in conversation and the experiences nurtured in one niche do not feed into related niches.

## 1.7 SLE: unstructured social research environments

In research processes, the objects of study, which are the research problems, are usually complex, unstructured and the solutions are at times unpredictable (Spiro, Feltovich, Jacobson, & Coulson, 1992). These unstructured problems occur in unstructured environments, where prior solutions that were successful may not apply to new problems and contexts. The solutions require non-linear creative thinking and deep analysis of the problem. This entails the learning processes that are unpredictable and cannot be formally pre-planned (Spiro, et al., 1992), as what happens in formal learning models.

Researchers need to exercise their *mental stamina* to attain rigorous research outcomes. They need to reuse their learned knowledge to address new problems in novel situations that are different from the initial conditions when knowledge was gained. Since the problems solved are generally ill structured, they exert pressure on the researcher due to non-linearity of learning from research activities (Spiro, et al., 1992). The complex and unpredictability of research environments requires that learners “*develop cognitively flexible processing skills*” (Spiro, et al., 1992, p 58), meaning that learners need to recombine their cognitive knowledge to align with new problem situations.

Extending Spiro et al. (1992) argument on flexible learning environments that allow knowledge presentation in diverse ways, this thesis argues that social learning spaces promote critical thinking as different learners in these environments bring different perspectives of knowledge. In addition, the cognitive development of learners who are part of social groups is fundamentally shaped and transformed by the behaviour and means employed by the group (Wertsch, 2002). Given its aforementioned limitations, traditional supervision environments are insufficient for providing ‘flexible learning environments. Therefore “*a reconceptualisation of learning and instruction is required for advanced knowledge acquisition*” in SLE that are “*ill structured*” (Spiro, et al., 1992, p. 63), and where learning is unpredictable.

*Reconceptualisation* stems from research activities that may differ from conventional learning activity systems and this may warrant researchers’ adjustment to a learning model/process where novices learn through observation and mentoring each other during execution of

activities. The learning mode follows a “*learn as you do*” or experiential learning and is discovery based in which learning happens as the activities are being executed *in situ* (Wenger, 1998; White, 2010). Such learning environments are advantageous in that unlike learners passively acquiring information from an instructor out of situation, “*learn as you do*” environments “*avoid the problem of inert knowledge*”, but situate “*knowledge in the context in which it will be used*” (Kass, Burke, Blevis, & Williamson, 1994, p. 389).

## 1.8 Research proposition(s)

The study proposes Social Learning Environments (SLEs) that mitigate the problems of traditional supervision methods. The study proposes a learning model that extends learning and supervision to include social learning in an augmented knowledge-building environment. The model thus reconceptualises traditional supervision from its ‘vertical’ mode of supervisor-student to a ‘horizontal’ and distributed learning conception that is “*associated*” with “*dispersal of responsibilities and of agency*” (Boud & Lee, 2005, p. 502). In the ‘horizontal’ conception, students form “*networks of learning*” in which they share research knowledge by participating in communities of research practice (Boud & Lee, 2005, p. 502) with limited supervisor oversight.

Community participants share research experiences, and the knowledge discoveries they make amongst them undergoes a continuous transformation as it is handed down to the posterity over time.

*Artefacts* embrace the shared values, beliefs and include tools, concepts, paradigms, methodologies and assumptions that defines a community (Bronack, et al., 2006). A historic accumulation of artefacts created through research activities would help in the continued existence of meaningful research practice (Allan & Lewis, 2006; Kintsch, 2009). However, the accumulation of research artefacts that helps advance the research practice demands systematic harvesting of generated artefacts. Such artefacts would assist old and new researchers to learn from the accumulated knowledge of research practice, passed from one research generation to the other.

## 1.9 Learning and knowledge creation in a social research community



Bingham and Conner (2010) define learning as “*the transformative process of taking in information that, when internalised and mixed with what we have experienced, changes what we know and builds on what we can do*” (p.19). Internal representations are changed as new mental models are constructed in relation to what one is experiencing externally in the environment. The community that surrounds an individual defines the external environment and influences consciousness. Drawing from Lave and Wenger (1991) and Wenger (1998), figure 1.1 below depicts how research entities are related in an ecosystem.

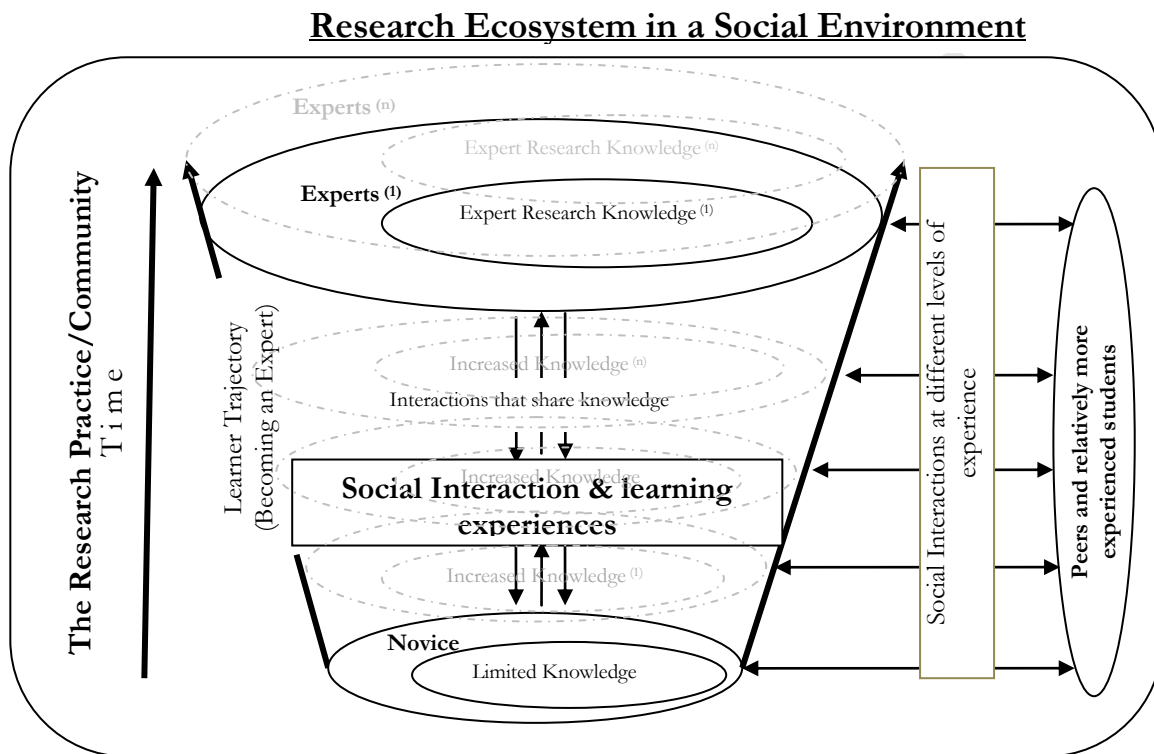


Figure 1.1: Envisaged Research Ecosystem

The *raison d'être* of the research discipline is advancement of knowledge sustained by a dynamic research ‘ecosystem’ that continuously creates new knowledge. Such an ecosystem comprises a community of researchers who possess varying degrees of research knowledge. Drawing on Wenger’s (1998), the system provides an opportunity for novice researchers to learn and gain research knowledge from peers, knowledgeable senior students, and expert researchers. Learners enter the community as novice researchers with limited knowledge and are immediately exposed to experts, and assume a sense of belonging to the community. They are

introduced to the research practice and take a 'learning trajectory', towards becoming experts as they overcome research problems, and gain experiences which bequeath to newcomers (Lave & Wenger, 1991).

Novices progress through involvement in social activities and modelling peers and experts. As novices become knowledgeable, 'abstract principles' and their application in a practice are learnt *in situ*. As Lave and Wenger (1991, p.122) argue, novices are transformed into *practitioners as their changing knowledge, skill, and discourse constitute development of an identity as a member of a Community of Practice (CoP).*"

Over time, the novices, peers, experts, and the community evolve as new knowledge is created. The broken lines in Figure 1.1 depict different knowledge acquisition stages followed by the novice, researcher and expert during social learning. Although the acquisition of knowledge follows a continuum (Lave & Wenger, 1991), for simplicity in diagram, the levels for the novice are shown as *Increased knowledge<sup>(1)</sup>* to *Increased knowledge<sup>(n)</sup>* for the novice, and *Expert Research Knowledge<sup>(1)</sup>* to *Expert Research Knowledge<sup>(n)</sup>* for the experts. At each level, knowledge is shared through social learning with peers and experts.

The arrows in the middle of the diagram indicate the passing on of experiences by novices, peers and experts as they interact in the community. When experts or novices at certain levels exit the research ecosystem, knowledge would have passed on to the newer generation of researchers. The research ecosystem depicted in figure 1.1 can be supported by online learning environments that enables 'peers' and knowledgeable individuals to make explicit their tacit knowledge about research experiences.

## 1.10 Rationale of the study

Distributed social learning uses technologies to form distributed CoP, which are geographically distributed groups of individuals with common interests (Daniel, Schwier, & McCalla, 2003). For students on dispersed campuses, learning happens in ill structured environments that demand reconceptualization of the research supervision and research processes in SLE.

This study addresses the challenges discussed in Section 1.6, by arguing for a learning community that foregrounds knowledge sharing, and learning requirements of novice researchers. This presents an alternative learning model that distributes cognition and allows a socio-constructivist learning environment where learners learn as they create new knowledge. Students are not confined to their course convenors or mentors, but often socially respond to advice and feedback from mentors, academic staff, and peers from within and across disciplines.

The study investigates the extent to which these interactions contribute to learning of research processes, and leverage traditional supervision methods. It follows, therefore, that social learning is multi-disciplinary, and breaks disciplinary boundaries. According to Bronack, et al. (2008), such environments require new approaches to learning that may significantly differ from those offered by traditional educators. A substantial part of our learning is embedded in the social context of our lived world and occurs in practice (Merriam, Courtenay, & Baumgartner, 2003).

For research students, there is a formal linkage between them and academic staff who are their supervisors, and a number of communication channels are agreed upon between supervisor and students. It is however difficult for research students to find other researchers who share their research experiences other than their supervisors or immediate academic staff. Mindful of the often solitary nature of research journey of most novices, the transactional nature of online technologies can be drawn upon to provide a discursive learning community where knowledge is transmitted, contested and critiqued.

This research investigates social learning as a complement to the traditional supervision of postgraduate research. It seeks to understand the research challenges that new researchers experience in learning research processes, their learning as an outcome of social interactions with other researchers, how they resolved these challenges, and how a SLE enhances collaborative learning.

## 1.11 The research questions (RQs)

### 1.11.1 Main question:

**How does a SLE leverage traditional supervision methods of novice research students?**

### 1.11.2 Sub questions:

- i. What learning strategies do students use when conducting their research activities in a social environment from project conception to compilation of research results?
- ii. What learning challenges do postgraduates face in their conduct of research and how do they address them?
- iii. What role would a Web-based information harvesting-tool play in the research activities of students?

## 1.12 Theoretical framework

A community of practice (CoP) concept, which embodies socio-cultural, situated learning and social constructivism theories, guides this investigation. These theories inform the CoP conceptual framework used in this study. Learning through social interaction in a community is based on the principles of social constructivism. Bronack, et al.'s (2006) articulates Social Constructivist principles:

Learning is participatory; knowledge is social; learning leads development through shared activity; and knowledge base emerges through meaningful activity with others (Bronack, et al., 2006, p. 221).

### 1.12.1 Social Constructivist paradigm

Social Constructivism explains “*knowledge as the product of social practices and institutions, or of negotiations between relevant social groups*” (Younga & Collin, 2004, p. 376). The social

constructivist paradigm's intellectual roots are in some leading theorists: Piagets (1970), Vygotsky (1978), Bruner et al. (1976) who made different contributions to the theory. Piaget (1970) emphasises the role of the external/social environment in acquisition of learning and interrelated to internal knowledge. The central place of collective knowledge production is further articulated by Bruner et al. (1976) who coined scaffolding, which describes expert's provision of academic support that enables the novices to progressively accomplish more cognitively demanding activities. Scaffolding is further expanded in Vygotskian concept of Zone of Proximal Development (ZPD), which highlights the distinction between the individual accomplishments of a learner while acting independently, and his academic achievements in the presence of a mentor or knowledgeable peer.

This intellectual development resonates with this thesis' focus on social learning where learning is contextual and an active process where learners construct knowledge *in-situ*, and cognition is situatiaonally created, rather than acquired. A community provides a socio-cultural space/context for knowledge construction and contestation.

### **1.12.2 Communities of Practice (CoPs) and social learning**

CoPs provide an alternative learning space to the traditional school model for learning. It provides a framework or context that presents conditions for dialogue, knowledge creation, and participation in learning activities by novice researchers. For Lave and Wenger (1991), social learning is an integral aspect of 'the social living world'. "*Learning becomes, fundamentally, a social phenomenon and is placed in the context of our lived experience and participation in the world*" (Wenger, 1998, p. 3). Learning about other people's experiences, involves "*mash-up snippets of data*" and adding them to one's own mental schema and expanding their interpretations (Bingham & Conner, 2010, p. 21).

Communities have individuals with various levels of experience, including practitioners who share their experience gained through practice. When novices engage with these practitioners, they construct their identity and increasingly become competent in the practice (Lave & Wenger, 1991; Wenger, 1998). Vygotsky (1978) suggests that social consciousness appears twice, first as an inter-mental process (involving interaction with peers and mentors) and then

as an intra-mental process involving internalization and development of higher psychological functions . According to Andrew et al. (2008) cited in White (2010):

Communities develop their practice through a variety of methods, including: problem solving, requests for information, seeking the experiences of others, reusing assets, coordination and synergy, discussing developments, visiting other members, mapping knowledge and identifying gaps (Andrew et al., 2008 cited in White, in press, p.2).

These activities unfold mainly in an academic CoP.

### 1.13 Research design and methodology

A naturalistic study (Lincoln & Guba, 1985) was employed to develop in-depth descriptions of the geographically distributed students' perceptions of their research experiences, and to examine the evidence collected from the online data-harvesting tool. Using CoP concept, the emphasis was on the social-construction of knowledge and on whether social learning is mediated by historical repertoires that evolve over time and developed by a community in an unstructured atmosphere.

### 1.14 Outline of the thesis

The introduction chapter contextualises the research study, explores the research problems and the study's rationale, and introduces the theoretical and analytical frameworks.

Chapter 2 provides a literature review pertaining to the research context outlined in Chapter 1 above discusses knowledge and highlights the importance of social constructivism and communities of practice as guiding frameworks for informal learning.

Chapter 3 provides a methodology, research strategy, research design and data collection tools used in the research.

Chapter 4 highlights the analysis of evidence and maps out the analysis strategy as well as presents the findings.

Chapter 5 presents and discusses the findings.

Chapter 6 reviews the RQs, study limitation, and provides suggestions for future research and conclusion.

## 1.15 Chapter conclusion

Given its highly personal nature, traditional supervision is insufficiently poised to support meaningful research processes that unfold in socially mediated learning environments. An overview of the challenges faced in traditional supervision and associated social learning environments that leverage traditional supervision by providing alternative learning environments for students were discussed. The rational for the study was provided and the communities of practice were introduced as the theoretical framework.

## Chapter 2: Literature Review

### 2.1 Introduction

This chapter documents the literature on traditional supervision, knowledge creation, and CoP. The central argument of this chapter is that learning in social environments augments the traditional supervision methods. The chapter also discusses mediation of social learning by online learning tools. Since Chapter 1 introduced the dynamics of learning by students in SLEs that inform research processes, this chapter builds on that by exploring knowledge generation in CoP that reinforces student social learning.

The chapter first explores traditional supervision literature, then examines knowledge creation processes, communities of practice and social learning theories and provides a conceptual framework that guides this research.

### 2.2 Traditional supervision of research studies

Research supervision is provision of support to students to counterbalance the isolation learners often experience in academic context (Samara, 2006). Traditional supervision of research at HEI often involves one-to-one dialogues between a supervisor and a research student, and group supervision of students is rare except for group projects (Ibid ). In addition, the one-to-one relationship between the supervisor and student employs the transitive approach to education whereby the knowledge that the student gains is a transfer of the supervisor's knowledge (Manathunga, 2005). For Manathunga (2005), traditional supervision is a 'private space' in which the trade of research are transmitted to the student. This reinforces a master-apprentice model in which the apprentice follows what the master dictates. Manathunga (2005) reiterates cases where some supervisors conceive their students as personal commodities and may be hostile when the students seek assistance from others about their research.



## 2.3 Knowledge creation in a social learning environment

Knowledge comprises justified true beliefs and originates through deductive or inductive reasoning. A more plausible definition of knowledge is *tacit* abilities of a learner and the *explicit* form, which is objective know how that can be expressed in words (Nonaka, et al., 2000).

Tacit knowledge includes a learner's innate abilities or skills, and is acquired after countless experiences (episodes) and is not easily convertible or transmitted. It may only manifest itself through human activities (Tee & Karney, 2010; Tsoukas, cited in D'Eredita & Barreto, 2006). Tacit knowledge is therefore a composition of experiences that become personal expertise which form a person's mental models and schemata (D'Eredita & Barreto, 2006). The process of making sense from an experience is usually tacit because it is dependent on prior encounters. It is dependent on how meaningful the learner interprets a situation. The models include beliefs, paradigms and viewpoints that a learner uses to perceive the world.

Learning in an unstructured or semi-structured way is a fundamental process in tacit knowledge creation (Howells, 1996, p. 92). Traditional classroom setup learning is pre-structured and follows a hierarchical development, and the outcomes are linear and predictable (Huotari, 2008; Paavola, Lipponen, & Hakkarainen, 2004). SLEs, however, do not follow linear learning processes as the problems are unstructured and unpredictable (Spiro, et al., 1992) making them ideal environments for tacit knowledge creation.

When learners meet in social environments, they share tacit knowledge as depicted in figure 2.1 below. Expert researchers possess tacit knowledge that may be difficult for them to



Figure 2.1: Knowledge sharing in a social environment: Adopted from (<http://www.slideshare.net/trib/knowledge-worker-20>)

articulate. The varied questions that novice researchers may pose to experts, however, may cause the tacit knowledge to surface thus transforming it into sharable explicit knowledge. Therefore, social environments may provide space where tacit knowledge manifests itself through interrogation and doing research activities (Tee & Karney, 2010).

CoPs would view the tacit knowledge they share “*as an integral part of their activities and interactions*” (Wenger, McDermott, & Snyder, 2002, p. 9). This means that their activities are informed by the tacit knowledge in that community. Some tacit knowledge is sharable through interactions in informal learning processes that include mere conversations, coaching, and storytelling among others. CoPs, therefore, are environments that provide structure and place for such learning. Explicit knowledge is objectifying tacit knowledge. It is a way of making tacit knowledge more tangible by externalising it. It is text in official discourse, and can be communicated and formulated (Bereiter, 2002; Hall & Andriani, 2003) and can be shared via standardisation and procedures. Unlike tacit knowledge, explicit knowledge is articulated using formal languages for communication and can be codified into theories. CoPs are best poised to codify knowledge as they mix its tacit and explicit aspects (Wenger, et al., 2002). Knowledge and multimedia communications are artefacts contained in research repertoire that may contain researcher reflections, research challenges and possible solutions, and other objects that provide explicit research knowledge to the research community. Novices can use these repertoires of reflections to learn about research processes.

Explicit and tacit knowledge have meaning when constructed within a certain context, and hence when learners construct knowledge within such contexts that knowledge attains a meaning.

Social participation and interactions are critical for learning in contexts that provide settings for knowledge sharing and creation. The interactions can be either *collocated* or *dispersed*. Collocated interactions occur when learners are geographically located together: face-to-face, group meetings, conferences, seminars, and laboratory sessions. Dispersed interactions include emails, online forums, telephone conversations, digital stories, Web 2.0 tools including immersive environments such as 3D virtual spaces.

## 2.4 Mental Development in social environments

At individual levels, learning is an active process and can be regarded as knowledge construction processes that result in transformation of mental schemata. Mental schemata are the mental models/structures representing meaning as interpreted by a learner (Kintsch, 2009). Learners build on this mental schema through accessing long-term memory and integrating prior knowledge, personal experiences, and learning goals (Woo & Reeves, 2007; Çalik, Ayas, Coll, Ünal, & CoştuSource, 2007). The mental schema hence constitutes one's stock of prior experiences - a learner's tacit knowledge. The mental schema develops through interactions in constructivist environments such as SLEs, which enhance learning processes (Woo & Reeves, 2007).

Murray (2006) states that “‘Knowledge building’ draws on the collective intelligence of a group engaged in researching, theorizing, critiquing, doing, and synthesizing in order to progressively evolve some body of theory and practice” Knowledge creation, the “knowledge objects do not stand alone but are grounded on shared, cultural knowledge base” (cited in Kintsch, 2009, p.225). Cultural knowledge also helps different learners in creating knowledge and mental schemata that are shared and important to the community or practice. This work suggests that cultural knowledge provides historic guidelines and protocols required in interpreting the generic activities in a practice. In research practice, cultural objects include research methodologies and instruments that have been proven to assist in the success of a research study, and learners in the research community construct new knowledge using these cultural objects.

Group interactions are pivotal in learner's access to tacit knowledge that is of value to a community. During interactions, temporal ‘learner-supervisor’ roles unfold among participants, with the more knowledgeable learner acquiring the supervisor role. This implies that the traditional student-supervisor method is extended to the social activities of a community.

## 2.5 Learning communities

Wenger (1998) describes a learning community as comprising language, tools, explicit roles, procedures and regulations, and implicit behaviours and unstated rules of thumb. The learning communities provide an environment where peers coach each other and feedback from mentors encourage knowledge sharing. The learning communities are “*characterised by a willingness of members to share resources, accept and encourage new membership, regular communication, systematic problem solving and a preparedness to share success*”(Moore & Brooks, 2000, cited in Brook & Oliver, 2003, p.140).

When researchers undertake a study, they rely on work done by other researchers or they collaborate with others in solving research problems. During research, knowledge is continuously constructed and evolves through sharing and exchange of ideas in learning communities. In these communities, new knowledge is created through repackaging and repurposing of new insights.

## 2.6 Communities of practice (CoPs)

Wenger, McDermott, and Snyder (2002), define CoPs as “*groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an on-going basis*” (p. 4). CoP theory belongs to social practice theories that focus

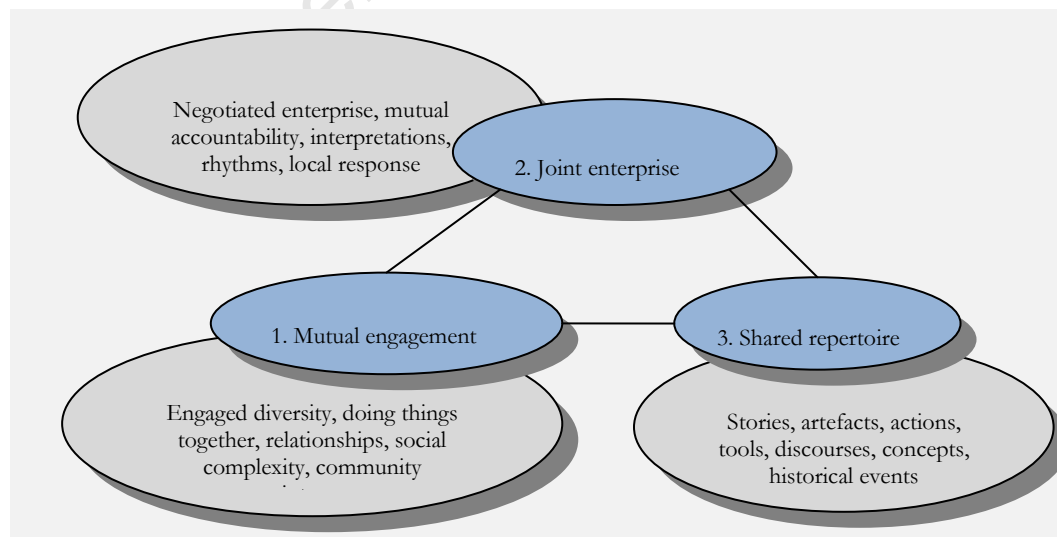


Figure 2.2: Dimensions of practice as the property of a community; adopted from Wenger, 1998

on productive ways of participating in real world activities. The social practice theories focus “on the social systems of shared resources by which groups organise and coordinate their activities, through mutual relationships, and interpretations of the world” (Wenger, 1998, p. 13). As Lave and Wenger (1991) argue, individual “participation is always based on situated negotiation and renegotiation of meaning in the world” (p.51), this is typical of what unfolds in SLEs. A CoP is characterised by three dimensions as illustrated by figure 2.2 above and as listed below.

1. **Mutual engagement** connecting participants in a variety of ways and defining membership;
2. Participation in a **joint enterprise**, a negotiated way of working together to achieve something; and
3. A **shared repertoire** of ‘*routines, words, tools, ways of doing things . . . which have become part of its practice*’ (Wenger, 1998, p. 83)

### 2.6.1 Mutual engagement

Wenger (1998, p.73), argues that, “*practice exists because people are engaged in actions whose meanings they negotiate with one another*”. There is a dual, reciprocal relationship between members of a CoP and the CoP, members shape the behaviour of the CoP and vice versa. CoP members have a shared understanding and practice in a particular knowledge domain (Wenger, et al., 2002). Individual researchers may have different approaches and aspirations on solving dilemmas they face in their individual research studies, but forge mutual and informal social understandings with fellow researchers who have different perspectives.

### 2.6.2 Joint enterprise

Joint enterprise involves the possession of a shared goal or objective and a practice that identifies with that CoP (Wenger, 1998). It is the mission of the CoP, necessary for its existence. The enterprise focuses actions in the community and drives sense making. Through an informal arrangement, the community negotiates mutual accountability and collectively responds to a community’s situation. According to Wenger; “*mutual accountability is being personable, treating information and resources as something to be shared, being responsible to others by not making life harder for others...*” (Wenger, 1998, p. 81). Gradually new members join the CoP while

some old members are dislodged and approaches, standards, and methods of the practice binding the community change due to interior and exterior influences. The shared goal (joint enterprise) changes in meaning in response to these influences.

### **2.6.3 Shared repertoire**

The third dimension for CoP is a shared repertoire, which denotes the reasoning style and ideas that identify with a community. These constitute the collective discourse from which participants derive meaning about the world. They become communally shared knowledge and reflection of the historical mutual engagement of the community. New meaning is created by reusing and repurposing the artefacts in the repertoire. Thus, “...*artefacts tend to perpetuate the repertoires of practice beyond the circumstances that shaped them in the first place*” (Wenger, 1998, p. 89).

### **2.6.4 CoPs as supporting knowledge creation**

Amin and Roberts (2008), state that CoPs are drivers of social learning and knowledge creation through group-based learning in situated practices. Some knowledge embodied in social practices (tasks, activities, and habits) include intuition, untold guidelines (rule of thumb), embodied understanding and shared views. Therefore, actors in practices learn such knowledge through social interactions that include use of community artefacts, verbal communication, and observation/ modelling of experts in action. Informal exchange of knowledge by domain practitioners helps in accessing experts' ideas, individual insights, and experiences to facilitate learning (Amin & Roberts, 2008). Bereiter (2002) argues that even though a group may have members with diverse thoughts, 'group thinking' will bring these divergent thoughts together to proceed with common discourse.

Deliberations at conferences constitute CoPs because despite the diversity of research papers presented generic forms of shared repertoires (structure, form and discourses) persist in these spaces. As they interact, members of a community share insights and approaches, advice and knowledge used in solving problems in a given domain. The discussions in CoPs centre on the common issues and perspectives, and participants' ambitions among other things (Wenger, 1998). Understanding the learning process through the CoPs social learning theory mitigates

against the problems identified in Section 1.6. Using CoP theory, interested researchers can begin to understand how groups of learners with common interests, such as a shared research discourse, can join to learn and advance that discourse through structure and content. Examples of structures with content include formation of Google groups, academic.edu, websites where academics share their research interests, their professional affiliations, friendship networks, and published materials. These environments are physical incarnations of CoPs.

### **2.6.5 CoPs opportunistic learning**

CoPs are a way of teaching particular actions in specific contexts. They support situated learning in that learning occurs through active interaction with experienced core participants in a practice. . Learning, therefore, is situated in the environment of practice, *in situ*, and not in a closed school environment (Hughes, et al., 2007) which is removed from the social processes of the real world. A CoP exploits the collective meaning making of all the participants in a community, and the participant's engagement in the practice of a community is a condition for effective learning (Lave & Wenger, 1991).

CoPs can be viewed as 'learning-groups' that provide an environment which fosters individual and group learning. Learning takes place through interaction and the exchange of knowledge amongst community members (Klein & Connell, 2008). Learning does not necessarily have a defined start and end but is an on-going, continuous process occurring when individuals are involved and active in developing an on-going practice, and negotiate meaning. Newcomers into a practice would learn from within the practice (Wenger, 1998) unlike in the traditional class room where learners follow a strict curriculum insulated from persistent collaborative practices and story telling.

### **2.6.6 Legitimate peripheral participation**

Legitimate participation allows the newcomers to participate in a real life context that enable access to all three dimensions/elements of CoPs discussed earlier (see figure 2.2). Initially, newcomers are introduced to members of the community. They then engage and get exposed

to actions and negotiations of the practice, and to the repertoire of the CoP. Informally, a *learning curriculum unfolds in opportunities for engagement in practice*” (Lave & Wenger, 1991, p. 93) and is not dictated for the practice. Newcomers are drawn into the culture of the community and ‘learn the ropes’. They participate in activities and get exemplars, meant to motivate them to learn more towards becoming core members. At initiation, the novices are seen as ‘legitimate’ members of the community (Lave & Wenger, 1991) enabling them to enlist expertise of experienced practitioners and participate in “*progressive and increasingly complex activities whilst also developing identity as members of the community*” (White, 2010, p. 3).

Novices participate in developmental activities and the participation may be planned to ensure systematic transfer of knowledge. Through expert support the novice has “*legitimate access to the cultural knowledge and practices of the community*” (White, 2010, p. 3). Therefore, support is fundamental for the novice to become a recognised member of the community. With time and as the novice becomes more experienced, he/she disengages from the support, he/she is more competent and involved in the community, and moves towards becoming an experienced practitioner. The three dimensions of ‘*mutual engagement*’, ‘*joint enterprise*’, and ‘*shared repertoire*’, help in understanding CoP concepts but are inadequate for understanding of social learning in an informal space. In the real world academics compete for recognition and status, so CoPs does not account for resistance to cooperation that unfolds in learning and research communities.

## 2.7 CoP learning aspects

CoP and social learning was introduced as the analytical framework in Section 1.12 and CoP theory is further discussed in this subsection. Wenger’s CoP promotes four aspects of learning, which are learning as belonging, learning as doing, learning as becoming, and learning as meaning. These constructs are expounded below.

### 2.7.1 CoPs foster community: *learning as belonging*

CoPs foster mutuality where members share same values and beliefs, and they benefit from each other by participation in CoP activities (Wenger, 1998). The activities include sharing of



ideas, telling stories-reflections, dialogues that add value to individual expectations and overarching goals of the CoP. CoP is a complex socially built web consisting of beliefs, common ideas and ways of thinking but tied to mutual recognition. Individuals may belong to various communities, differentiated by their communal qualities such as tightly or loosely coupled, and ‘modes of belonging’ (Warhurst, 2006). In academic research, learners and academic staff form study groups, reading groups, writing circles, colloquia, research retreats, which tend to be voluntary, spontaneous, although organised around a central theme.

### **2.7.2 CoPs foster practice: *learning as doing***

It is through practice that learners learn the ‘*how*’ of a practice or a knowledge domain (White, 2010). Hence, active participation in a practice defines a learner’s identity. From a socio-historical perspective, learning goes beyond just executing chores, but demands “*shared historical and social resources, frameworks, and perspectives that can sustain mutual engagement in action*” (Wenger, 1998, p.5). Therefore, when introducing newcomers to a practice/discipline, they learn through the legitimate peripheral participation process (Lave & Wenger, 1991). Through participation, they internalise that discipline’s norms, culture and practices, ultimately, the internalised practices become the individual’s tacit knowledge (Nonaka, et al., 2000).

### **2.7.3 CoPs foster identity: *learning as becoming***

For Wenger (1998), membership of a CoP translates to one identifying with that CoP and being an insider. As learners learn *about* problems, they also learn *to be* as they acquire an identity (Brown & Duguid, 2001), a “*constant becoming*” that determine who learners are or who they become (Wenger, 1998, p.149). When individuals learn about things, they also acquire “*the ability to act in the world in socially recognized ways*” (Brown & Duguid, 2001, p. 200). It follows that as novices learn through participation in the community, their competence as practitioners increase (White, 2010). As Mezirow et al (2000, p.27), states:

“Our identity is formed in webs of affiliation within a shared life world.... It is within the context of these relationships, governed by existing and changing cultural paradigms, that we become the persons we are”.

Social communities define contextual places where individuals can self-express and share their life experiences. Lave and Wenger (1991) argue that an individual's identity is simultaneously constructed, therefore, learners may view a community as a platform from which they define who they are at a given time in their life experiences. It is through such legitimate peripheral participation that novices or learners, who are at a periphery of a profession, acquire an identity (Wenger, 1998). Through acculturation within a community, the novices assimilate the behaviours, the knowledge, and ways of thinking that are core to a community.

#### **2.7.4 CoPs foster meaning: *learning as experience***

In CoP meaning is a socially constructed endeavour that is a result of countless negotiations from past and present participants (Hung, et al., 2006). Wenger (1998) argues that communities produce “*abstractions, tools, symbols, stories, terms and concepts that reify ... a practice*” (p.59). The assumption is that not every research study can occur in isolation from other historically accumulated societal knowledge and from input of some form from other researchers.

The historically developed tools and instruments are artefacts that mediate learning when students are conducting research. The artefacts contain “*meaning, purpose, roles, affordances and resistance*” (Bereiter, 2002, p. 480) to the research activities. As new meaning is negotiated, other humans are directly or indirectly involved, and multiple dimensions, such as interaction with others, the artefacts used in the negotiation and prior experiences, all shape meaning-making (Wenger, 1998).

### **2.8 Summary on implementing CoP concepts**

CoP theory can be applied in many contexts where a group of practitioners informally share their experiences of particular discipline. Sharing of experiences and knowledge by individuals reinforce authentic practices and subject matter of that particular domain among practitioners. Newcomers benefit and become more knowledgeable and concurrently, new knowledge is socially constructed in the community (Klein & Connell, 2008). The community's repertoire

contains historic artefacts that trigger transformation of individuals and the research community.

To appreciate research processes, new researchers mutually engage with old timers in the research field, and engage within the practice. Learners are exposed to the actions and negotiations of meaning in research and have a repertoire of research resources at their disposal.

The next section discusses CoP framework in relation to online tools.

### **2.8.1 The socio-constructivist theory and online environments**

Social constructivism focuses on the active creation of content and sharing of knowledge using various artefacts through interaction to develop individual meaning (Kok, 2008). The conversations that ensue induct learners into a CoP that embodies certain norms, values and beliefs (Lave & Wenger, 1991). Social constructivism illuminates the collaborative construction of knowledge within learner groups. Learners interact to contribute their knowledge, negotiate meaning and possibly reach an understanding about issues related to theories and practice. The theory is central in that the constructivist's perceptions are engaged with when learners learn research processes.

Technology has introduced various environments into education that enable learners to exercise different learning styles (Brady, Holcomb, & Smith, 2010; Brook & Oliver, 2003). Brady, et al. (2010) contends that various virtual learning environments (VLE) and educational social network sites (SNS) provide the learning environments that have tools and facilities to cater for diverse learning styles. In these technologically mediated environments, learners are able to self-evaluate, self-assess, and reflect as they learn. Kok (2008), report that environments such as MOODLE, which is a learning management system, provide virtual environments that give learners control of their learning process and to '*individualise their learning experiences*' (Kok, 2008, p. 89). The environments encourage learners to be more exploratory, interactive, to collaboratively share their experiences, and to create content.

## 2.9 The Conceptual Framework

The conceptual framework provides a visual representation of what the dissertation discusses (Carspecken, 1996). It provides the research context, guides and informs the research, it “explains, either graphically or in narrative form, the main things to be studied—the key factors, concepts, or variables—and the presumed relationships among them” (Miles & Huberman, 1994, p.18). The processes, interactions and other aspects of a SLE are complex and may not be easily represented in a diagram. Therefore, Figure 2.3 below, derived from theoretical concepts discussed in this chapter, endeavours to graphically capture different dynamics of interactions and research in a learning community. These are: the social context, the research artefacts and research objects, interactions, and knowledge creation process.

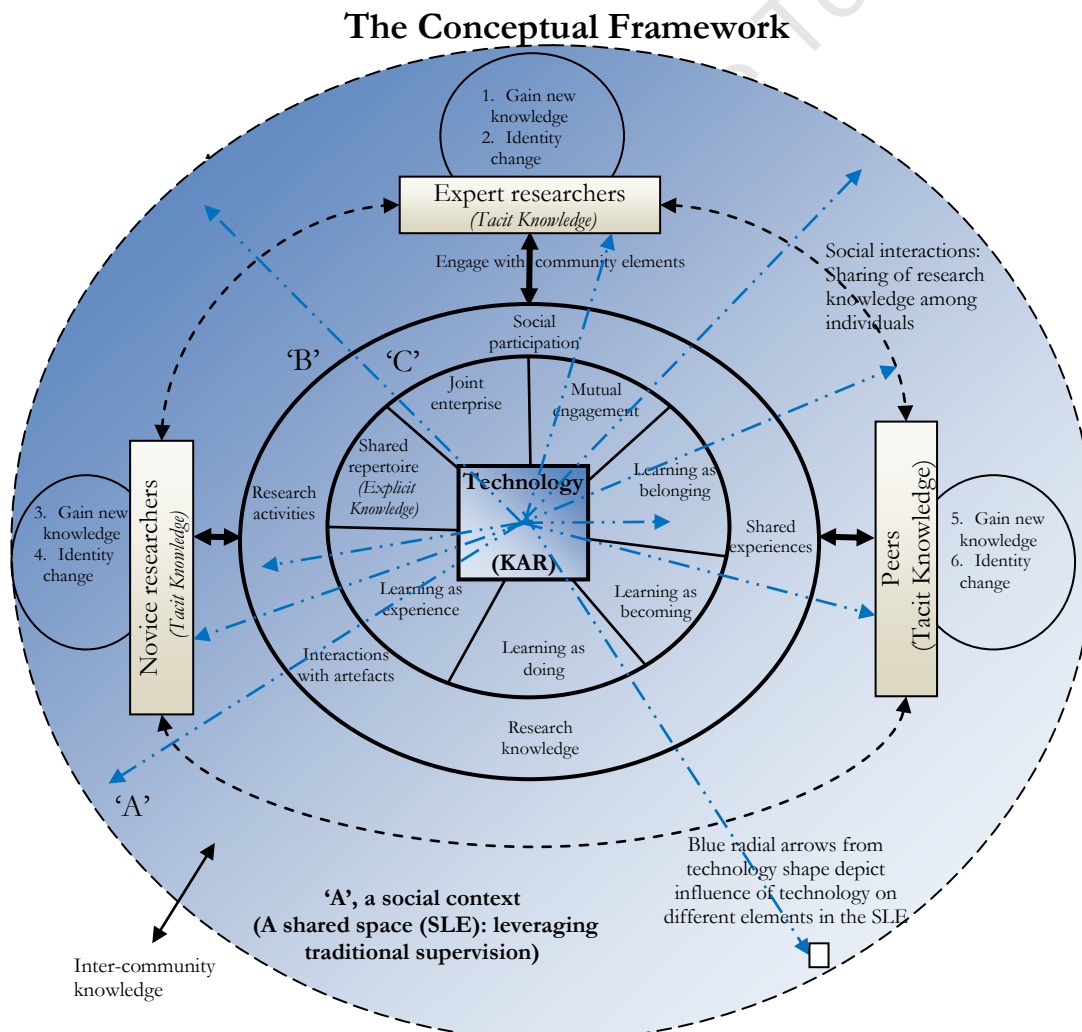


Figure 2.3: Conceptual Framework

The model indicates the salient features of the proposed conceptual framework informed by CoP.

In the figure shown above, 'A' is a 'social learning community (see Section 2.5), that forms an informal social context which provides tools, procedures and regulations, and behaviours and rules of thumb to enable participants to share knowledge (Wenger, 1998).

For Wenger, et al. (2002), the most useful knowledge is embedded in one or more communities, and actors may provide cross-community artefacts and gain knowledge from multiple social communities. 'A' has permeable boundaries that allow members to be active in multiple communities and disciplines, creating a virtual community that is boundless. Knowledge shared with other communities is called '*Inter-community knowledge*'. This allows actors to introduce practices from one community into the other, thus one of the roles of actors is to become knowledge brokers (Wenger, 1998).

Three main participants are shown: '*Novice researcher*', '*Peers*', and '*Experts*' and their respective roles are novice learner, a more knowledgeable learner, and experienced participant. These participants possess varying levels of tacit knowledge, for successful research processes. Through their community participation and interaction with community resources, their tacit knowledge is transformed via a continuum. The inner most circle 'C' contains the three CoP dimensions and the four learning constructs that make up the core of a social learning environment, the elements that are the building blocks of CoP theory. The next inner circle 'B' indicates additional features that are present in a research learning community. All elements in the community are interconnected in support of the learning research process.

Technology, such as online environments, is shown in the middle of CoP elements to indicate its mediation of community' research activities (page 29). By indicating technology in the centre of the framework, it symbolises a gluing function in the community. The radial arrows emanating from the centre have been added to the conceptual framework to symbolise the influence technology has as a catalysing factor in the activities of the SLE. The radial arrows terminate on different elements of the community depicting how technology may add value to these elements such as the participants, the interactions, the four social learning aspects, and

the three CoP dimensions. The KAR enabled distributed peer based knowledge sharing and facilitated interactions among participants separated by distance and time. A distributed peer sharing allows any individual to decide what they want to share, when to share, and whom to share with.

## 2.10 Chapter conclusion

This chapter provided a literature review on research learning communities and interrogated three CoP dimensions, 'It also discussed CoP as fostering the four learning constructs namely *'belonging'*, *'doing'*, *'becoming'*, and *'experience'*. It also articulated the affordances of technologies in research community interactions. The chapter concludes with a conceptual framework that synthesised all the concepts raised in this chapter.

The following chapter maps out the methodology, research paradigm, the strategy, and the method of data collection employed in conducting this research.

## Chapter 3: Research Design & Methodology

### 3.1 Introduction

While Chapter 2 interrogated existing literature on traditional supervision methods, knowledge creation, CoPs and social learning, and proposed a conceptual framework, this chapter extends that discussion by providing a methodology that implements the framework. Despite a growing body of literature that investigated social learning, the contribution of technology to student development of research skills in a SLE, remains speculative. Mindful of this gap, this chapter explores the potential of online information technologies to support research-driven interactions and learners' reflections on research experiences.

An online tool called knowledge audio repository (KAR)<sup>3</sup> was designed and implemented to apply CoP concepts. Using the KAR as a shared context, a group of research students interacted, shared, and constructed knowledge through socialisation. The aim of the study was to investigate research processes of a community with specific interest in the possible learning processes, knowledge repertoires that developed through knowledge sharing, as the community evolved over time.

### 3.2 Research paradigm (interpretivism)

This research adopts interpretivism as methodological lens for understanding the dynamics and complexities that students in a learning community encountered during their conduct of academic research.

The research explored novice researchers' processes of undertaking research to gain a deeper understanding of the research processes, activities, interpret the interactions, including the challenges they encountered when conducting research and how they resolved them. In interpretivism (Burrell & Morgan, 1979; Denzin & Lincoln, 1998) the researcher becomes

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<sup>3</sup> The Knowledge Audio Repository online tool is discussed in Section 3.5

actively involved and participates as well as observes. See the table below that shows how this research fits in within the interpretivist paradigm.

Interpretivist Paradigm	This Research
“Reality does not lie outside the individual, but each person is subjectively involved in his or her experiences”(Thomas, 2006)	The recordings of each novice’s narrations of research experiences to provide an interface for explaining their perceptions of learning in a shared space
Attempt to understand how humans make sense of their surroundings	The study explored the meaning making processes of novices interacting in an online learning community, one in which they co-created knowledge and engaged with each other. It documents experiences students go through, their challenges, and perceptions towards the use of KAR as a mediating tool in their research activities
Interpretivists believe that reality is not objectively determined, but is socially constructed (Husserl, 1965).	To investigate knowledge construction by research participants in a common space where the participants speak their minds and views on research problematics

*Table 3.1: Mapping of interpretivist paradigm to this research study*

### 3.3 Conceptualisation

The overarching methodology was virtual ethnography in which the research becomes a research instrument by interacting with participants in a purposively designed online environment that situated the participants in a research practice. The study examined the interactions between novice researchers, peers and experienced researchers through the legitimate peripheral participation lens discussed in the previous chapter. One way of understanding learner’s different perceptions or realities, is for a researcher to immerse oneself in the activities and the world of the subjects being studied (Krauss, 2005). The researcher became an active participant who engaged with the activities of the online research



community. Krauss (2005) further argues that in order to attain the social knowledge of another, one has to participate in the mind of the other. “*Social knowledge refers to the broad variety of human activities, concepts and ways of being social, or ‘knowledge of doing’*” (Krauss, 2005, p. 764). The stance the researcher took was a form of participant observer (Creswell, 2008; Miles & Huberman, 1994) in which the researcher actively participated in the activities on the online community. In this way, the researcher would identify with the experiences of other participants and would understand the emergent issues and debates in the community.

The KAR online tool was conceived as a method for online data harvesting as it provided a social context that enabled learners to interact and purposefully develop a community of researchers. The KAR demonstrated the ability to enhance social presence, cognitive presence, and collective intelligence, features that promote online interactions (Bronack, et al., 2006). Social presence is the “*ability of learners to project themselves socially and emotionally in a community*” (Paulus, Horvitz, & Shi, 2006, p. 357). Cognitive presence is when learners use the discourse in a community to confirm meaning (Bronack, et al., 2008). Collective intelligence is premised on the view that knowledge is distributed in a community and the artefacts individuals generate during interactions (Gunawardena et al., 2008).

### 3.3.1 Communities of practice as an analytical framework

Wenger (1998) discusses a ‘social theory of learning’, which was used to analyse student research activities to answer questions that related to learning through participation in an open

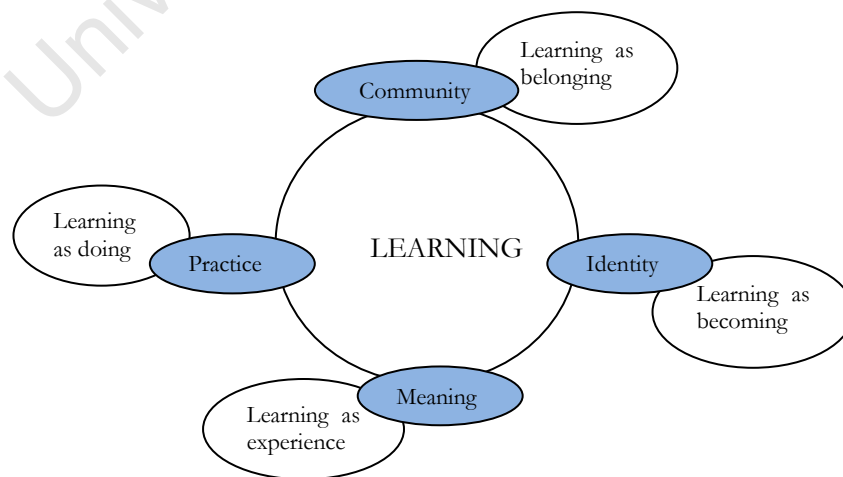


Figure 3.1: Components of a social theory of learning: Adapted from Wenger, (1998, p.5)

social community. Figure 3.1 illustrates the four constructs that constitute Wenger's social theory of learning. The theory was discussed in Section 2.6.

In addition, CoP theory is characterised by three dimensions as discussed in Section 2.6 of Chapter 2. These dimensions and the four social learning constructs constitute the analytical framework for this study. These are later used in Chapter 5 to interpret the evidence gathered.

### **3.3.2 Applying CoP to an online research learning community**

Drawing from principles of social constructivism, a dynamic online SLE of student and expert researchers that exploited CoP concepts was built. As researchers make their experiences explicit, research knowledge resources were created which would be used as research learning artefacts for novice and the more experienced researchers.

The knowledge audio repository (KAR) tool, discussed in the next section, follows a research multimedia environment typical of educationally-focused social networking sites (SNS) like Ning<sup>4</sup> and Campus Elgg<sup>5</sup>. The KAR is a dynamic online research space developed for this study where experts and novice researchers interacted to share their research experiences. Multimedia research materials cultivate an understanding necessary for researchers to have a relationship with the object of their study. A social environment with artefacts created through researcher reflections over time helps other researchers to understand some key concepts related to their own particular purpose of study.

## **3.4 Research design**

The research design was based on a case study approach (Yin, 1994).

The study interprets the interactions of a group of researchers who shared their views, beliefs, assumptions, knowledge, challenges and research artefacts and who attached shared meaning to research phenomena.

### 3.5 KAR-The online research environment instrument

Tee and Karney (2010), argue that provision of a shared context in which students engage in problem-solving and decision-making activities encourages learning processes that are necessary for learners to develop tacit knowledge. The research instrument was KAR, an authentic online environment for novice researchers to ‘meet,’ reflect and discuss their research challenges, and to learn from each other’s experiences, and share research knowledge. This served as a platform for “*cultivating new layers of understanding, [...] tacit in nature, through activities involving synthesis, externalisation and internalisation*” (Tee & Karney, 2010, p. 403).

#### 3.5.1 The KAR Environment

The KAR<sup>6</sup> is a form of an online CoP social learning environment that mediates the interactions amongst the student researchers as they would share and construct knowledge (Nussbaum, Alvarez, McFarlane, Gomez, Claro, & Radovic, 2009). Postgraduates from several disciplines and universities were invited to use the KAR’s threaded interaction forums to discussion their research processes and challenges. This created an online CoP that brought together learners separated by time and space. They would access the KAR whenever they wanted to share their experiences, discuss research topics, or to respond to other postings online, as the participants worked on their individual research study. The SLE allowed participants to express their knowledge the best they could from their own perspectives. KAR features included video, audio, and textual forms to present and share research experiences through constructivist-learning activities.

The KAR is part of other platforms that are on the website. The screenshot shown below shows the homepage of the website, and to contribute content, users needed to login. Figure 3.2 shows three platforms and to access KAR’s login page, one need to click the ‘KNOWLEDGE AUDIO REPOSITORY’ image shown in the picture below.

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<sup>4</sup> [www.ning.com](http://www.ning.com)

<sup>5</sup> <http://elgg.org/>

<sup>6</sup> [www.mobiledfaq.co.za](http://www.mobiledfaq.co.za)



Figure 3.2: The different online platforms in which KAR is contained

The participants would be able to post and respond to postings after obtaining an account assigned by the site administrator. Figures 3.3, 3.4, 3.5 and 3.6 below show additional screenshots from the KAR.

Figure 3.3 shows breadcrumb navigation at the top, and to the right, the main topics or ‘threads’ of participant’s postings under the heading “*Teaching students research processes*”, which was the main title of the KAR platform. The KAR tool would structure the conversations by threads, with all related postings falling hierarchically (nested) under the main thread.

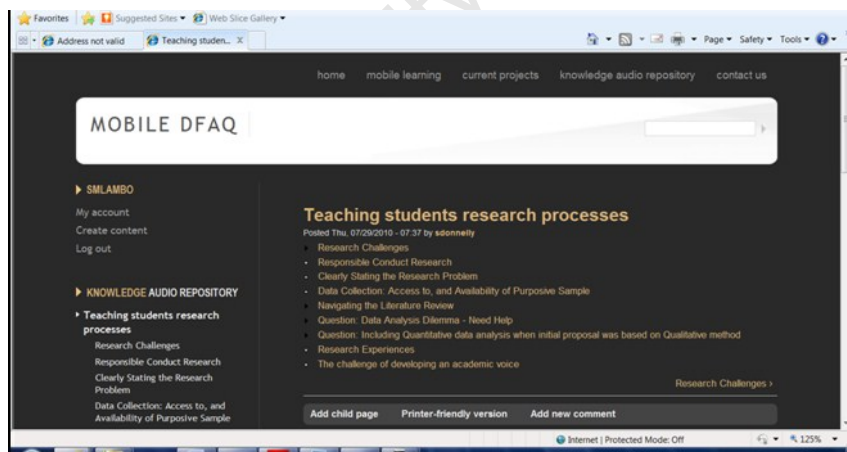


Figure 3.3: KAR, main page, showing navigation and main threads of posted topics

Figure 3.4 and 4.5 show some of the expanded postings, indicating some research issues raised by the participants.

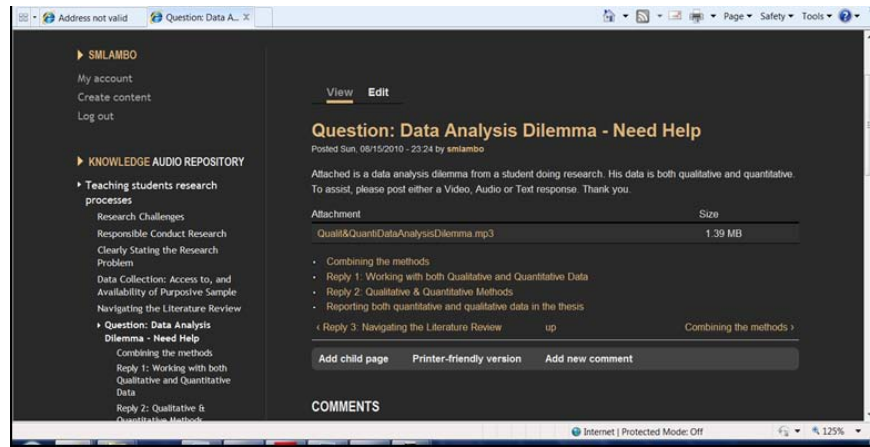


Figure 3.4: KAR main page, showing tree structure of main threads to the left side

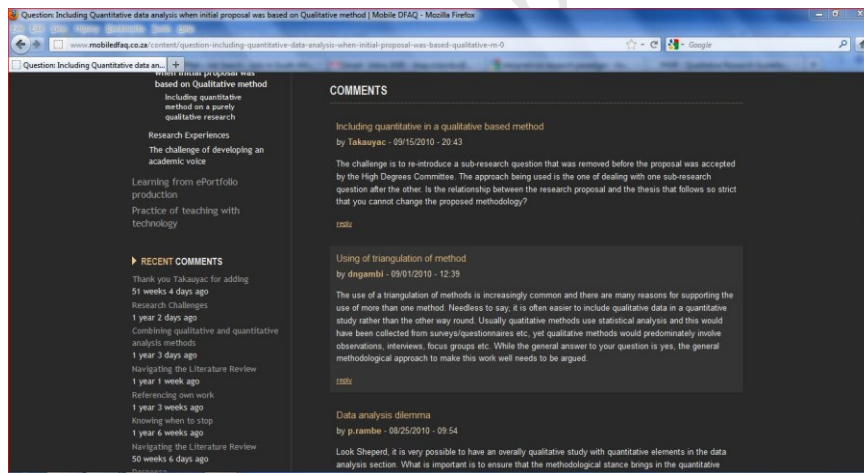


Figure 3.5: KAR, showing a comment and a posting

Included in the KAR are tools that could be used to upload audio and video files; this is shown in figure 3.6 with an audio file attachment, indicated by (a).

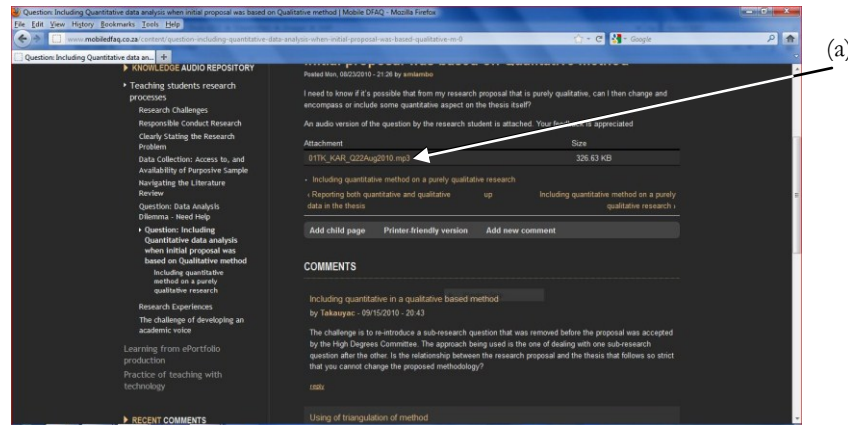


Figure 3.6: KAR, showing an example of a posting with an audio attachment

The KAR presented the main elements of a community of practice, which provide collective knowledge for community members in one place and mediates sharing of tacit knowledge that exists amongst community members. It provided a source of knowledge and a collective learning environment for members, and enabled members to tell stories related to their research experiences.

### 3.5.2 Sampling and sample size

Marshall (1996) discusses three strategies for selecting a sample for qualitative studies: *'convenience sample'*, *'judgement sample'* also known as *'purposeful sample'*, and *'theoretical sample'*.

**Convenience sample:** This is used when the researcher selects participants who are most accessible. The factors for selecting this strategy could be because it would be least costly to a researcher in terms of time, financial cost, and effort (Marshall, 1996).

**Judgement sample:** This is the commonly used sampling technique that uses a more productive sample suitable to answer the research question (Marshall, 1996). A number of variables can be used to develop a framework that studies a broad spectrum of participants *"(maximum variation sample), outliers (deviant sample), subjects who have specific experiences (critical case sample) or subjects with special expertise (key informant sample)"* (Marshall, 1996, p. 523).



**Theoretical sample:** Qualitative studies are an iterative process. The emerging data/evidence emanating from the iterative process warrants building interpretive theories. New samples may be selected to analyse and expound the emerging theories (Marshall, 1996).

The researcher sought to perform a naturalistic study that provided the behaviours of participants in a research community. The research question guided the choice of sampling methods used (Marshall, 1996), a critical case sample (purposeful) and convenient sample was chosen for the study. The selected students making the sample had to be specifically involved in a research process.

One of the identified limitations of traditional supervision methods was that of distance between location of students and supervisors. In light of this, the researcher sought to include as research participants, individuals from different universities, conveniently, using a mailing list and known individuals were requested to participate. The participants were drawn from three universities in South Africa indicated by 'A', 'B', and 'C' on the map in Figure 3.7 below, a total distance of approximately 1500km between 'A' and 'C'. A qualitative sample must be adequate to answer the research question (Marshall, 1996).

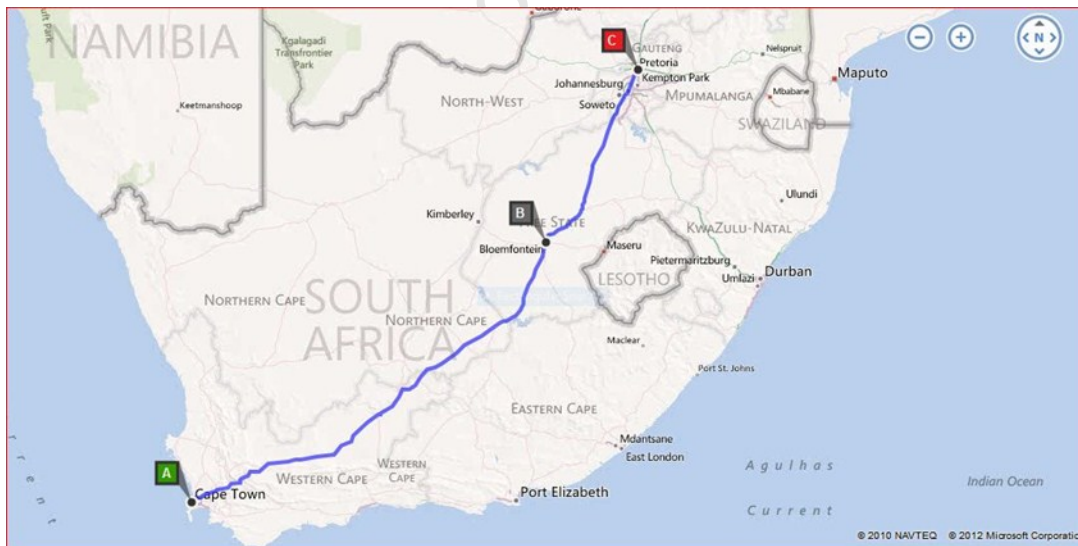


Figure 3.7: Map of South Africa indicating sample locations A, B, and C, from [www.bing.com/maps](http://www.bing.com/maps)

The sample was made up of seven (7) participants drawn from the three indicated locations was deemed adequate by the researcher for a mini dissertation which was not complex enough

to go beyond single digit of participants. Location 'A' had five participants as it was conveniently located at the researcher's home university, one participant agreed to take part from a university in Bloemfontein (point 'B'), and another from a university in Pretoria (point 'C').

### **3.5.3 Participants and data gathering**

Two sets of participants in the research community were involved, (a) A group of seven postgraduate students (regarded as novice researchers) who were at various stages in their thesis, and (b) two expert researchers who gave valued inputs and comments on the KAR online tool. Generic research processes are shared across disciplines and the research process problems in one discipline may be similar in other disciplines. Hence, the research focused on postgraduate students conducting research studies from different universities and disciplines. The interactions that were investigated covered the period from July 2010 to November 2010.

Using word of mouth and email, students were invited to participate in an online research community where they interacted and exchanged their research experiences with input from experienced researchers who shared their expertise through comments that potentially provide positive learning trajectories for the novice researchers. Five students managed to create at least one posting on the online tool.

### **3.5.4 Participant Profiles**

The following is a brief profile of participants. A brief description of their research interests is in Appendix A. Pseudonyms are used to protect the identities of students.

Five out of the seven (71%) core student participants in this study were at master's level and were new to the research process that required them to investigate and write a long report of at least 25,000 words. The other two (29%) were students at PhD level. One student 'Sue' at PhD level was the only one conducting a laboratory experiment using non-human subjects, and would use purely quantitative method in her analysis. All other students used human subjects in their research. 'Tibo', 'Herm' and 'Paki' used questionnaires, which had both open and 'scaled-type' of questions. In their final report, the three would use both mixed-type



methods. 'Eshi' was using purely qualitative methods and 'Mic' had completed his course work and was in early stages of his research but indicated that he would use qualitative methods. Finally, 'Sib' was doing masters by research only and she adopted a qualitative research type.

The participants were at various stages in their dissertations. At the time of conducting this study, Sue was conducting experiments, collecting data in the labs. Herm was designing and collecting evidence through various methods that included online and emailed questionnaires. Eshi was conducting face-to-face interviews, constructing his evidence. Tibo was at the analysis stage and was struggling with the use of mixed methods. Paki had just finished his methodology and had handed it to his supervisor for feedback. Finally, Sib had just conducted her fieldwork abroad and was analysing evidence.

The design of KAR research is expounded below in an eleven-step strategy. A flowchart in figure 3.8 illustrates the sequence of the steps, which are:

- i. Create an online SLE containing tools similar to a digital storytelling or social network environment.
- ii. Canvas offline and record the research challenges/issues that students are facing.
- iii. Transcribe and clean-up the audio/video recordings obtained in step (ii) above.

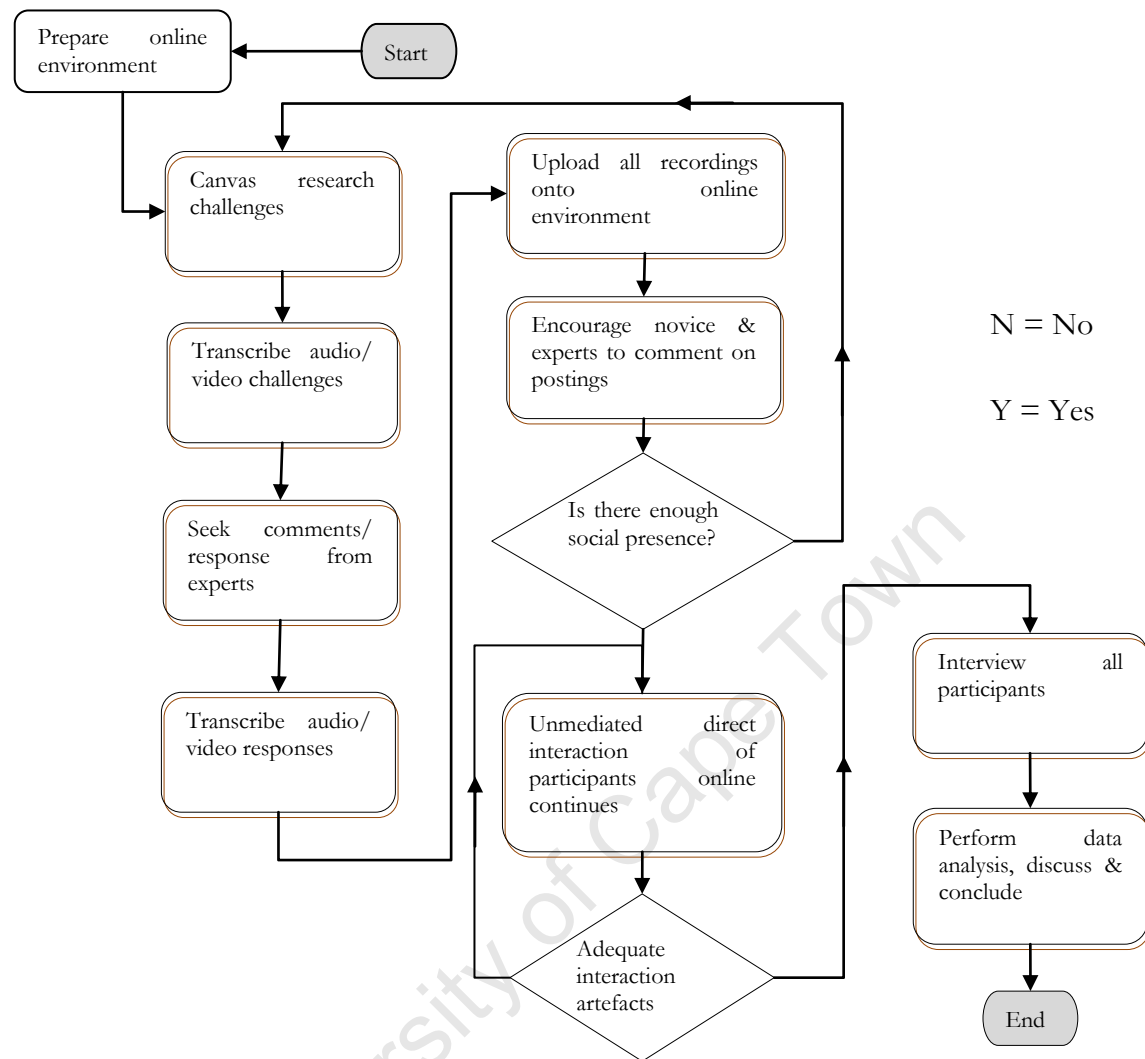


Figure 3.8: Research Strategy

- iv. Seek offline, comments and responses from expert researchers in response to the research challenges/issues obtained in step (ii) above.
- v. Transcribe and clean-up the audio/video recordings obtained in Step (iv)
- vi. Upload onto the online tool the artefacts created in steps (iii) to step (v) above.
- vii. Encourage the initiator of the research challenge/issue and other participants to view the request for help and the response online and for anyone to make further comments on the response from the expert researchers.
- viii. Encourage the experts to comment on the comments made in (vii) by the research challenge/issue originator and other peer participants in the study.

- ix. Repeat steps (ii) to Steps (viii) until such a time that the conversation in steps (vii) and (viii) is self-sustaining and occurring naturally without the mediation of the researcher.
- x. Interview participants to obtain information on their experiences about the KAR knowledge tool.
- xi. Perform analysis of the online conversations and of the transcriptions of the semi-structured interviews, interpret, conclude and report.

## 3.6 Role of researcher

### 3.6.1 Setting up the tool for the online community

Step (i) of the strategy was to create a web-tool that created a sense of research community for novices. A web environment subdues temporal and spatial differences and facilitates activities of a community. One of the supervisor's projects at the Centre of Educational Technology at UCT is developing a Knowledge Audio Repository prototype to be used for creation of learning 'multimedia' (video, audio, graphics, and text) artefacts. Using part of this platform for this study, a 'Research Knowledge Audio Repository' was setup. This hypertext-based space served as a rendezvous for student researchers and experts to share their views, ideas, beliefs, insights, problems and solutions, experiences, and other research objects and concepts. This would enrich individual research processes and provide knowledge to whoever joined. Peers would contribute and learn from other participants through access of historic artefacts built over time.

Options for participants to post their contributions and to respond to other actor's inputs were available. The online tool was to incorporate options for artefacts provided in different 'multimedia' artefacts. Participants used any preferred form that best presented and published their contribution. It was hoped that as material developed from participant inputs, nodes would surface; each node could be implemented as a thread.

Studies indicate that social presence is one of the main factors that increase a sense of community on online courses. Studies suggest that students with a higher social presence tend

to participate more on online courses (Cobb, 2009; Gunawardena and Zittle, 1997; Rovai, 2002)

### **3.6.2 Canvassing for student experiences and expert comments offline**

Steps (ii) to (vi) were offline activities. The reason for working offline was due to several factors, which are discussed in Section 5.13.

### **3.6.3 Introducing participants to the online tool**

The participants were introduced to the KAR online tool and expected to pose questions on challenges they were facing, their research experiences, exchange ideas, views and gain insights through online interaction (see figure 2.4). The participants had a choice to interact online by using audio, video, or text tools. As per requirement in the proposed strategy outlined above, step (vii) emphasises encouraging participants to be active members of the community. The researcher, however, had no control over the number of postings and frequency of interactions on KAR.

## **3.7 Instruments and methods of data collection**

Data triangulation describes the use of multiple methods of data collection to protect the researcher against bias (Creswell, 2008). To enhance the validity of research findings, the following data collection methods were used.

### **3.7.1 Data mining of online artefacts/narratives**

Some research evidence were extracted from students' online interactions and the postings canvassed by the researcher. Learners were encouraged to post research-based challenges hindering the smooth progress in research and any research information they wanted to share. The postings were immediately accessible to all participants online. Peers and experts contributed some responses, comments and invaluable research insights.

### 3.7.2 Interviews

Mishler questions the traditional decontextualized stimulus-response model of interviewing which entrenches skewed control of the interviews process by the interviewer. This asymmetric balance of power does not give the interviewee joint construction of the outcome of the research (Mishler, 1986). To counter this imbalance, and improve the validity of evidence, recorded online interactions were corroborated with semi-structured interviews to solicit information in normal conversations that tried to situate the evidence provided in their research environment.

**Semi-structured interviews:** Collection and analysis was done simultaneously using thematic analysis that involved a constant comparison analysis (See Section 4.2.1). A number of data collection techniques such as document analysis, interviews, literature review, and observation may be used in qualitative studies. In addition to the data mining of online artefacts, and as part of the triangulation of data collection used to enhance validity, the researcher chose in-depth semi-structured interviews to gather the perspectives of participants on SLE.

The semi-structured interviews conducted with participants, averaged twenty five to forty minutes, they combined open-ended and closed questions. The interviews allowed for a more natural conversation as the interviewees told their research stories and experiences, and interview guide questions were not strictly followed. The interviews solicited information on research students' research experiences, their research challenges, and support they got to address them. They also covered participants' experiences of KAR tools and their engagement in an online research community where novices and experts shared research knowledge.

**Face-to-face:** In-depth face-to-face semi-structured interviews were conducted with research participants. Quiet isolated study rooms in laboratories with minimum interference were selected for the interviews. There were few close questions and open-ended questions, with a flexible interview guide in which the researcher could ask different follow-up questions depending on the context and the response given by the interviewee. The average duration of the interviews was 30 minutes. All the interviews were audio recorded and later transcribed for analysis, see Section 4.2.2 for data organisation.

### 3.7.3 Additional data collection instruments

**Questionnaires:** To solicit additional information, questionnaires with open-ended questions were sent to 7 respondents via email. The respondents electronically filled in and returned the questionnaires via email.

**Telephonic:** Lichtman discusses some new research strategies using the Internet in qualitative research (Lichtman, 2006). She suggests that when participants are inaccessible due to cost or distance but are available online, the Internet can ideally substitute for interviews. A telephonic interview lasting 35 minutes was conducted with one participant researcher from a university in a distant province.

**Google Chat:** To fill-in the gaps in the evidence, an online interaction using Google-chat was conducted with one participant. Google-chat was considered for this participant who was already using Google-chat feature since we had failed to meet him on several occasions for a face-to-face interview.

## 3.8 Ethical consideration

To protect the identity of participants, pseudonyms were used. The confidentiality of their responses was guaranteed and data was reported in aggregate form to ensure respondents' anonymity. Before enlisting participants' involvement, study objectives were articulated to all participants. The respondents consented to the use of excerpts of their responses.

The promotion of CoPs should not be formalised, individuals are allowed to freely forge and shape the direction of CoPs (Wenger, McDermott, & Snyder, 2002). With this in mind, and the focus being on individual postgraduate students undertaking research, it was felt by the researcher that clearance to request for student participation was only necessary at individual level. Requests for participation were therefore sent, targeting the individual postgraduate students by virtue of them doing individual research studies. The approached students were made aware of the study through a cover letter of the consent form before they voluntary

agreed to participants. Additional debriefings were conducted before interviews. Appendix C provides a blank consent form and some completed samples.

### 3.9 Credibility, validity, trustworthiness, and reliability of evidence

Marshall, 1996 states that the sample should not only take into consideration “*the individual’s but also the temporal, special and situational influences*” which are the context of the study (Marshall, 1996, p. 524). These may affect the credibility, validity, trustworthiness, and reliability of the results. The trustworthiness of the evidence collected in this study may have depended on the timing of the interviews and on how far the participant was into their research study.

#### 3.9.1 Limitations in the Study

The contribution and level of participation may have been affected by amount of work already done and yet to be done in individual participant’s studies. Further discussions of factors that may have affected this study are provided in Section 5.13.

### 3.10 Chapter conclusion

This chapter discussed CoP as an analytical model and the implementation of KAR online tool used in this research. Finally, it outlined the research design used. The next chapter presents the analysis of evidence and findings.

## Chapter 4: Analysis of findings

### 4.1 Introduction

The previous chapter outlined the methodology and data collection methods. This chapter gives a detailed analysis of evidence collected from three sources: the KAR web tool, questionnaires and interviews. Wenger's social learning theory and CoP are deployed as an analytical framework for the analysis of KAR tool postings and interviews. The conceptual framework in Section 2.9 synthesises the underpinning framework of this study. This is therefore, useful for understanding this chapter. The analysis is divided into two main sections. The analysis of the KAR evidence, and then the analyses of semi-structured interviews and questionnaire evidence are presented. The last section discusses the postgraduates' learning challenges during the conduct of research.

### 4.2 The analysis process

#### 4.2.1 Thematic analysis

Thematic analysis was used to guide analysis of evidence, and involved researcher's immersion in the raw data to extract main themes from it. Thematic analysis enables the understanding of the meaning making structures and to remodel the decisions made by individuals (Wagner, et al., 2010). Miles and Huberman (1994) suggest that thematic analysis should generally follow the following stages (i) Data collection, display reflection, (ii) Data coding & distillation, (iii) Generation of key themes, and (iv) Story report and conclusions. These stages guided the open coding to create categories from text acquired through interviews and online postings.

The evidence was a corroboration of analysis which draws on CoP and thematic analysis. By sifting through the text, data was sorted and categories were created drawing on CoP analytical framework and concepts emerging from the codes. This method of analysis involved a constant comparison between the analytical framework and raw data to determine the relevant category and level at which all raw data applied and could be fitted. The four analytical



constructs from Wenger's framework and the three CoP dimensions became the central categories.

#### **4.2.2 Data organisation and meaning making**

The KAR, participants who consulted with peers, supervisors, and knowledgeable contributors provided online evidence for this research. Other evidence included transcribed audio-recorded interviews, and emailed supplementary open-ended questionnaires. These were all captured into NVivo7 and Microsoft Word software. Interviewees received the transcriptions for proofing and confirmation, and validation as true records of their utterances.

The semi-structured interviews comprised closed and open conversations that allowed free discussions to proceed without interfering with the thought processes of the interviewees (Wagner, Lukassen, & Mahlendorf, 2010). Reading from the primary documents like transcripts and postings on the KAR, assisted the researcher to reconstruct the inherent meaning (Carspecken, 1996) embodied in the evidence. This study focused on the learning experiences of graduate students as they interacted with peers and experienced researchers, and with the artefacts of the research field.

#### **4.2.3 Capturing of evidence and editing**

*Appendix B* provides evidence on participant interactions in the KAR, recording of interviews, and questionnaire. The researcher imported the transcripts into NVivo7 software for analysis and organisation of evidence. In conjunction with NVivo7, a word-processor software, Microsoft Word, was used to interpret into themes the codes that were developed in NVivo7. A long document emerged from cutting and pasting chunks of evidence from several documents generated by NVivo7. The main themes related to the learning theory emerged. The various chunks were colour coded and comments that attempted to interpret all the data chunks were used for analysis.

Ary, Jacobs, Razavieh, and Sorensen (2006) contend that use of excerpts of raw data helps the reader to indirectly experience the setting and assist in understanding how conclusions were

reached. The following analysis sections extensively use the quotes from student participants. The numbered text gathered from the field is in *Appendix B*, and the section numbers with an (EV# – for evidence) prefix are used as reference. EV#/SUP-is evidence from academic supervisor/expert researcher, EV#/KR-denote evidence from a knowledgeable/experienced researcher, and EV#/STD-is evidence from a novice student/learner. The difference between the supervisor and knowledgeable researcher is only that the supervisor was an academic staff while the other was experienced in research though not a staff member. Qualitative interpretations situate findings within larger meanings (Creswell, 2008, p.42), and so before and after inserting response excerpts, brief interpretation of participants' responses are provided.

#### 4.2.4 CoP analysed

As discussed in Section 3.3.1, CoP provided the analytical lens for this chapter. This is operationalized by presenting the evidence under each of the CoP constructs. To recap the concepts, when novices interacted in social environments with potential to offer experiences of learning as (a) belonging, (b) doing, (c) becoming, and (d) experiencing, and providing conditions for (a) mutual engagement, (b) a shared repertoire, and possibly, (c) a joint enterprise, the result of such interaction is possible knowledge creation.

Table 4.1 below maps some of the traits that emerged during analysis of evidence in this chapter. The bolded characteristics in the table featured in the evidence. Where they appear in the analysis, they are emphasised during interpretation by italicising.

Main theme	Sub theme (Bold indicate evidence from analysis)
<b>Mutual engagement</b>	<b>Engaged diversity,</b> <b>Doing things together,</b> <b>Relationships,</b> Social complexity, Community maintenance
<b>Joint enterprise</b>	<b>Negotiated enterprise,</b> <b>Mutual accountability,</b> <b>Interpretations,</b> Rhythms, Local response
<b>Shared repertoire</b>	<b>Stories, artefacts,</b> Actions, <b>Tools,</b> <b>Discourses,</b> <b>Concepts,</b> Historical events
<b>Community</b>	<b>Learning as belonging</b>
<b>Practice</b>	<b>Learning as doing</b>
<b>Identity</b>	<b>Learning as becoming</b>
<b>Meaning</b>	<b>Learning as experience</b>

*Table 4.1: CoP elements mapped as the themes for analysis*

From the evidence gathered, some extracts could well be categorised in more than one CoP element. However, the findings were categorised and discussed in one element that best suited the extracts, without repeating them elsewhere for simplicity.

### 4.3 Analysis of KAR evidence

The KAR interactions started mostly in a disjointed way, a common feature of such online environments. The KAR recorded interactions as threads posted online, and these were

harvested for analysis. A few talk back processes occurred, which were suggestive of learning having occurred. Using steps (ii) to (vi) of the research strategy, initial interactions were catalysed by soliciting offline and uploading the evidence from participants.

KAR interactions unfolded among students who were carrying out their individual dissertations. Thus, the dilemmas, challenges and responses posted were genuine expressions of their research experiences that contributed to the learning process of students as they proceeded with their research. These interactions occurred among geographically dispersed students, some who had not met face-to-face. A few extracts from the web tool will help indicate that the postings did contribute moderately in better understanding research processes and related issues<sup>7</sup>. Participants indicated that they learnt from the interactions as they applied the suggestions given by peers.

The threads are discussed thematically using learning theory constructs and CoP's three dimensions as the themes.

#### **4.3.1 Learning as belonging**

##### **Peer based support:**

The traditional model for conducting a postgraduate research usually relies on the supervisor for mentorship. In the following extract, the student is seeking help in the KAR, beyond the traditional supervisor as main source of assistance. He mentions '*a peer research group*' they formed to help themselves discuss issues pertaining to research processes, suggesting '*learning by belonging*'. Therefore, the student found the meetings '*helpful*' supplements to the support beyond his supervisor:

"I have been battling with mainly two challenges, with a third one in the pipe line. My supervisor and a peer research group have been helpful in lessening the burden" (Ref: EV293/STD).

This demonstrates complementary support from peers in the same research community. The peer group complemented the mentoring role of supervisors.

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<sup>7</sup> See Figure 3.5 in Section 3.5.1 for an example of postings in the KAR

Through narration of research challenges in social contexts, peers and other individuals were able to share their research knowledge and experiences. Students were not isolated when conducting their research studies. They had peers from whom they “*ask for help when [they] can’t explain... suggested by a peer.*” Therefore, belonging to a community was critical to knowledge sharing. One student narrated his research problem to peers.

“Like how do you ask for help when you can’t explain your problem? Anyway, the good thing about my new discovery is the book was suggested by a peer after I told him about my struggles of finding stability in my research” (Ref: EV311/STD).

Through socialisation, sharing of research artefacts unfolded. The consulted peer used his prior knowledge by sharing reading material that assisted in learning research processes. When the student mentions ‘*explain your problem*’ and ‘*suggested by a peer after I told him*’, this indicated scaffolding happened through student interactions via KAR and knowledge was shared.

### **Mediated environment – A shared sense of belonging:**

Unlike the student-supervisor face-to-face conversations, the KAR enabled interaction from learners at different times and settings. In the following extract, the student uses ‘*we*’, ‘*we’re*’, ‘*more people were*’. These words and phrases indicate a ‘*shared sense of belonging*’ by students. Student appreciated the use of technologies that supported knowledge creation in a social constructivist environment: the KAR. The KAR also connected learners in different places, so learners were not expected to log online simultaneously to access content. The KAR afforded archived and retrieval of artefacts at any time.

“I have noted that through internet interaction, more people responded than in face-to-face talk. So it was helpful since we work at different times” (Ref: EV291/STD).

Students reportedly learnt from the contributions from other participants. The following extracts “*useful responses from the other postgraduate students*”, and that “*the answers they provided answered my question*”, are indicative of the academic value of peer-based responses. Other postings were affirmative compliments:

“I am thankful for quite useful responses from the other postgraduate students” (Ref: EV335/STD).

“Most answers peers provided answered my question right away” (Ref: EV336/STD).

### **Summary:**

This section addressed the research sub questions 1.11.2 (i), and research sub question 1.11.2 (iii). From the evidence, students drew upon peers and experienced researchers’ support when conducting research activities. The informal social environment augmented supervisors driven support. Therefore, KAR mediated the knowledge creation process by providing a meaningful learning ‘*space*’ for participants.

### **4.3.2 Learning as doing**

#### **Engaging in practice:**

It is through ‘*doing*’ the activities of a practice that learners internalise the norms, cultures and practices of a discipline. Literature review was one of the research processes shared by researchers. The following extract affirms the mediating role of literature review discussions in building research models. Allusion to “*doing a good literature review*”, and “*come up with a conceptual framework*” projects pragmatic learners who drew on key processes of doing research like formulation of a conceptual framework for the research and conducting comprehensive literature reviews. Hence, through a pragmatic approach to problem solving, participants learnt as they were doing legitimate work.

“I agree, doing a good literature review has helped me to focus on what I want to do and out of that, I have managed to come up with a conceptual framework/model for my research” (Ref: EV297/STD).

Close and extensive readership, are inevitable research processes that enabled student contribution to online spaces and their peers to gain memory traces of what their peers were ruminating on thus contributing knowledge. In the following extract, the novice researcher acknowledges the role of extensive reading in supporting learning research processes.

“My opinion on selecting theories is: first read and read as much literature as possible but be focused on what research question that you are trying to tackle” (Ref: EV303/STD).

This section answered RQs 1.11.2 (i) and (iii). By actively participating in research, students internalised research norms, culture and practices online SLE's mediation. As evidence suggests, students were involved in authentic research activities, which rendered hands-on experience in research processes

### 4.3.3 Learning as becoming

#### Mastering domain practice:

Novices thrive to gain knowledge to become expert in particular practices. A practice will have norms and ways of doing activities whose mastery affords public acceptance by expert groups in a discipline. A novice becomes expert by acquiring an identity through social interactions and engaging with disciplinary processes. Learners gain practice knowledge through such activities as sharing of views, perspectives, and role playing.

Extract EV326/STD used in Section 4.3.1 suggests acquiring of knowledge which is indicative of a novice becoming a more experienced individual. When the student says "...*you have suggested a very good strategy of aligning ones research questions to the literature...*" (Ref: EV326/STD), it shows new understanding by a student. Discovering a strategy of aligning components of a research study is an indication of using new experience gained in solving research problems.

The following extract shows student recognition of acceptable knowledge during research. The claim that "*this is one experience I still have to master*", suggest a realization of multiple realities that have to be mapped against what stands as '*acceptable*' research work:

"Another challenge is knowing how to pull "punch lines" that succinctly describes your research. Putting it in the most clearest non-ambiguous and acceptable words. This is one experience I still have to master. I tend to wind about not nailing it" (Ref: EV298/STD).

#### Internalising research processes:

Through the hurdles which students encounter, students learn to navigate and internalise knowledge for future problem solving. Such experiences become part of their tacit knowledge, which they externalise through with their peers in informal environments like KAR. The

following extracts highlight the difficulties in forecasting appointments. Such sharing may become part of the experiences - a form of tacit-to-tacit knowledge transfer.

“Getting appointments [to interview participants] was a bit problematic...”(Ref: EV313/STD)

“...samples'[participants'] access and availability should not be taken for granted; their availability doesn't mean their accessibility vice-versa. This is because their access and availability could derail, and change the project time-line! If I happen to use the same methodology in the future, I will do it differently” (Ref: EV314/STD).

In the above extract, a student acknowledges having learnt from difficulties and proposed a different methodology for the future, an indication of a possible change in behaviour. Therefore, participating in the KAR potentially increased students' competence as practitioners (White, 2010).

Other respondents offered suggestions on research techniques and methods ameliorate research hiccups. Here, a more knowledgeable researcher offers advice in response to a student's posting.

“, You could have tried sending an online questionnaire or dropping the semi structured in-depth questionnaire in their pigeon holes” (Ref: EV315/KR).

Such advice helps novice researchers and leverages the supervisory methods through use of the social environments. The affirmation that “*I really like the idea that ... the data to address the objectives of the question in the best possible approach*” (Ref: EV338/STD) demonstrates KAR's academic value.

“...I think this is one helpful way of reporting the data” (Ref: EV337/STD).

### **Gaining skills:**

Students learned the research processes and methods applied by other researchers in common areas of interest. In the extract below, a student reports his acquisition of research skill, namely developing a conceptual framework. The research accomplishment mirrors research knowledge development embodied in KAR.

... I have managed to come up with a conceptual framework/model for my research (Ref: EV297/STD).



**Summary:**

According to Wenger (1998), when an individual learns in a social environment, they acquire an identity, which makes them become insiders of a community. As such, they conform to the rules of engagement, shared repertoire and joint enterprise of research practice. Therefore, when students gained competences and research skills, they simultaneously gained an identity, identifying themselves with the community of research practitioners.

**4.3.4 Mutual engagement**

In the following extract, the student lists supervisors, and colleagues with whom he says, “*we should be able to devise new methods.*” This shows collective for maintaining a community - hence, evidence of mutual engagement.

“Through supervisors, colleagues and others, and through interpreting the situation on the ground, the initial methodology should be fluid, we should be able to devise new methods that will produce expected results” (Ref: EV319/STD).

The KAR created an information repository where group postings by participants and knowledgeable researchers provided research insights. Student acknowledged the guidance of the expert researcher who rendered a step-by-step discussion on how to conduct literature review (see EV324/KR). Acknowledging and appreciating help rendered is, according to Wenger (1998, p.81) showing a sense of ‘*mutual accountability*’ by ‘*being personable*’. Given that students were at different stages in their research, some students understood critical research issues better than newcomers. However, some mutual accountability existed as shown below:

“I think you have suggested a very good strategy of aligning ones research questions to the literature...Thanks for your assistance!”(Ref: EV326/STD)

Students reached out and requested for assistance from peers. Hence, KAR enabled mutual engagement with student requests for knowledge reaching participants in remote locations; in complementation of traditional student-supervisor dyad:

...it will be a good supplementary platform to share knowledge across time and boundary” (Ref: EV192/STD).

It will imply that people will be increasingly online to learn rather than waiting for face-to-face...will be more independent to learn...learning will not be confined within a narrow boundary... (Ref: EV193/STD)

### **Unhelpful comments:**

Not all contributions in the KAR were positive in helping out students to learn. Negative feedback from peers often forced students to resort to the supervisor. (See EV320/STD), and dissuaded some from interacting via KAR.

The answer to this student's question is: it depends. The supervisor is the only person who can know what it depends on, and so the supervisor should be answering this question (EV321/SUP)

Withholding information was another barrier to effective engagement in an online community. Some negative sentiments were expressed on appropriation of online tools.

No, people have to share but then students are reluctant to share, they would rather share on social issues than on academic issues. Yeah the tendency is to withhold information (EV72/STD).

Therefore, withholding knowledge was often conceived as an expression of retaining power.

Because it's just for your knowledge, so if you're interested you'll participate, if you're not interested, won't. But the problem is people will only participate when they have problems,... Just like myself since we're still in this research process, then we can participate because we know we can get something, but then after we're done with our research then if you're not doing research anymore you won't participate because there'll be nothing to compel you to participate (EV75/STD)

### **Summary:**

The KAR supported mutual engagement as participants interacted in activities to create knowledge and discussed relevant research issues. This addresses RQ 1.11.2 (i), mutual engagement in KAR to collaboratively negotiate meaning helped individual students to productively conduct their research. However the asymmetrical knowledge and academic power persisted as some participants withheld knowledge.

#### 4.3.5 Shared repertoire:

A historical repertoire of research artefacts guided object development in a socially connected community of researchers. The supervisor's excerpt below acknowledges the socio-cultural artefacts such as theories and concepts that help in formulating new knowledge. These '*concepts*', '*artefacts*', and '*tools*' as specified as traits of the '*shared repertoire*' in CoP help in understanding the 'discourse' of a community.

"A theory helps you conceptualize and also serves as a framework in which to anchor the concepts or constructs. This means that all the theories that you explored would help you to conceptualize differently and see the problem differently (Ref: EV301/SUP).

This highlights the value of theories as idea visualization tools and tools for communicating ideas to peers.

#### Repertoire of prior research work:

Peers and experienced researchers' postings eased the learning challenges experienced by students. The responses from students and experienced researchers offered pointers to best research material, tools, techniques and processes (e.g. EV311/STD, EV316/KR, EV322/SUP, EV329/STD, and EV333/STD). In turn, student participants responded by acknowledging how much they learned (EV326/STD and 335).

Novices can learn research methods and techniques from research work and reports done by other researchers. If knowledge gained from the community is to add value to the new knowledge created from present investigations, then it must be shared and incorporated.

"I noted that most the empirical research reports which incorporate both quantitative and qualitative divide the chapter on analysis of the data into two major sections; one for quantitative data and the other for qualitative data"(Ref: EV337/STD).

#### Summary:

This section provided evidence of students sharing information about research artefacts, and these communally shared resources provided information valuable in the conduct of their individual research studies.

### 4.3.6 Joint enterprise

This was not apparent in the KAR; however, there were ‘highly-focused discussions’ on some research topics such as Qualitative and Quantitative Methodologies, which would qualify as joint enterprise. Students debated some important research issues.

“*Mutual accountability*” is one of the characteristics listed under joint enterprise. Taking initiative to share acquired knowledge is one possible expression.

“On using both qualitative and quantitative methods: Linkages on these two methods are possible and you can combine them well in a ‘multi-method design’. I refer you to... [Then provides a citation]” (EV333/STD)

Below is evidence that fostered ‘*shared understanding*’ through the use of theories and common goals shared. Studies undertaken by individuals helped bind communities of researchers as meaning was interpreted through the conceptual artefacts applied in their studies.

...Another role of theory is to create a shared understanding of the research problem between you the researcher, and other researchers who will engage with your work” (Ref: EV301/SUP).

#### Summary:

Joint enterprise was not prominent in the KAR; however, the interactions and exchanges of research knowledge showed understanding of general research issues by participants. Such exchanges helped in furthering learner’s knowledge of the research practice.

## 4.4 Analysis of evidence collected from interviews and questionnaires

This section presents evidence gathered through questionnaires and interviews. , To analyse these, CoP constructs were reaffirmed in the analytical framework.

### 4.4.1 Learning as belonging

Students created informal peer research groups meetings that discussed research issues and promoted social learning through exchange of ideas. In such meetings, students narrated their research experiences as they developed their dissertations; and shared lessons learned: “*Because*

..., *when you meet with different people they tell their journey, then you learn from them*" (Ref: EV55/STD). This way, novices would learn what to foreground and what to avoid in research:

"The peer group meeting we had ... it's a learning process going through how the other, the articles how they write their dissertation or how they write their papers... it helped me to get something. It's like putting everything into its own location" (Ref: EV54/STD).

### **Cross fertilisation of ideas:**

In another quote, the student states "*the same help I'm getting from them they're also getting that help from me as we interact*" (Ref: EV29/STD). This indicates a sense of belonging to a community with similar interests and they exchange their experiences through discussions. This reciprocal exchanges of experiences help learn research processes.

The statement, "*I see it as like a two way traffic. Because if I'm learning from you ... you're learning from me*", denotes the reciprocity of the informal social environment

"To me I see it as like a two way traffic. Because if I'm learning from you definitely you're learning from me. You're presenting today and I learn from you and if I present tomorrow you learn something from me. (Ref: EV149/STD).

### **Promoting liberal contributions:**

Through social environments such as peer groups and other open and informal environments, students were more comfortable to express themselves than in the presence of a knowledgeable mentor, as indicated below. KAR provides asynchronous, anonymous communication that helped students in gaining confidence in contributing to the discussions. Postings were accessible and available anywhere any time. Hence the KAR promoted student liberation from awkward situations.

"With peers, you can ask anything, even questions that you would regard stupid and you would not ask your supervisor"(Ref: EV201/STD).

Other participants in the research community act as 'soundboards' that students rely on to check one's insights and confirm one's ideas. When applied in research, newfound knowledge

learned through sharing improves educational practices and the social well being of the community.

These viewpoints may induct one's critical thinking and help in developing vital ideas for one's research. In the following, the student consults the supervisor and others, and therefore learns by belonging to a social environment.

“...you can always ask many questions, you can always make several follow-ups and learn a lot from other people you know ... even if our communication were to continue, that would help us to learn a lot from those people, yeah”( EV51/STD).

Section 1.12.1, discusses ZPD; experienced researchers' supply discipline/domain knowledge critical to novices socialization into becoming experienced researchers. In the extract below, the student indicates that “*the researcher has to go an extra mile ...this creates a better and self-learning experience.*” Therefore, by belonging to a research environment with artefacts and experienced researchers, peers and community, learners reach greater potential required to solve problems on their own.

“With experienced researchers, they provide several options for one to choose from, it is not like they will say, this is the way to go. So this means the researcher has to go an extra mile to weigh the available options and this creates a better and self-learning experience” (EV201/STD).

### **Knowledge cross-pollination:**

A research undertaking involves multiple sub processes that may require knowledge input from different knowledge disciplines. Individuals who belong to completely different communities of practice or knowledge domains may provide knowledge to another. This is testimony that communities exists in an integrated web of communities, which interact and intersect, filtering knowledge from one community to another. In the KAR and off the KAR, students interacted with peers and individuals from other knowledge domains as shown below.

“My roommate helps much with things to do with software which I am not very good at” (EV104/STD, see also EV37/STD).

In the extract above, a student from the computer sciences assists one enrolled in the Education Department in the Humanities Faculty. This was a form of knowledge cross-pollination among students:

In EV220/STD extract, the student also indicated how his prior knowledge helped in his study. Students were acting as knowledge agents who belonged to several communities. They were able to use knowledge gained in one community to participate in activities of a different discipline.

**Summary:**

Discussion in Section 4.4 and this section about evidence collected from the interviews and questionnaires addressed RQ 1.11.2 (i). Being part of social learning groups augmented the traditional supervision with other researchers providing the extra insights for the novice researchers. Students from diverse disciplines were able to use discipline knowledge to construct new knowledge.

**4.4.2 Learning as doing**

Much of research work was supposed to be an individual investment. Through research communities students learned the '*how*' of research by interacting with research community artefacts. The statement that "*in research, you learn by yourself ... you go out there, get things by yourself. But then in class ...you get told*" demonstrates the pragmatism necessary in constructing knowledge. In formal learning environments, such as in classrooms, knowledge is acquired through predictable, pre-planned activities. However, in research communities the outcomes are unpredictable and unstructured:

"...most stuff in research, you learn by yourself. You, get things by yourself. In class you get told, but then in research you go deep and find things for yourself" (EV8/STD).

**Observation:**

Some students were involved in research processes that required them to observe natural phenomenon. They applied their prior knowledge and critical analysis of the observed

processes. The following extract reports the value of her genetics knowledge that helped her make some deductive observations:

Through observation of the behaviour of target organisms in the laboratory as well as looking at part of their [*dung beetles*] genetic make-up (EV130/STD)

### Summary:

Students had to be resourceful in order to construct meaning of research processes as they learnt. Through execution of their research activities, they simultaneously internalised the research processes, which was learning by doing.

### 4.4.3 Learning as becoming

Traits of students' transformation towards becoming experienced researchers through active involvement were evident. Students felt that as they engaged with research artefacts, shared research knowledge within the social context, they perpetually accumulated knowledge and learned research processes. These behaviours identify with those of a research community. One student professed that "*I have leaped from my previous research to a level I can confidently say it's two steps above [...]*" (Ref: EV101/STD). This smacks of progression towards being a central member of the research community.

Another evidence of progression in acquiring research knowledge is highlighted in the quotation below:

"Learning constantly as I go. Constantly reforming my understanding of research and the research process..." (Ref: EV219/STD)

The shift from being a novice researcher to an experienced researcher as one conducts his/her research is a gradual, deliberate process; in a continuous flux. Novice researchers transform into becoming knowledgeable about scholarly research by actively engaging with the research discourse. With passage of time, students saw their level of understanding research processes improved, as shown in the following extracts that are related.

"... But then I wouldn't criticise somebody's work the way I do now" (EV66/STD).



“I have become more experienced. I gained much on how to get information and what questions researchers normally ask as researches proceed” (EV171/STD).

Maintaining communication links, peer consultations and accessing research material, collectively advanced students’ tacit knowledge development, their externalization of knowledge through forum conversations and scholarly writing were vivid developmental manifestations. As participant alluded: “...*things are starting to unfold, I tend to understand more ... I can’t compare myself with when I started*” (Ref: EV69/STD).

### **Summary:**

As students conducted their research, they acquired research process knowledge by participating in their research activities.

#### **4.4.4 Learning as experience**

Meaning is a social endeavour – a consequence of negotiations by participants in a social environment. This is self-evident from one respondent who relied on specimen/artefacts from other researchers to understand the phenomenon she was researching. She emphasised that “*we have to refer to other papers or other people’s research ... see what they used and we try that*”, thus renegotiating meaning across different contexts “*..., some specimens or species are particularly difficult, so we refer to other papers or other people’s research. We are working on dung beetles but we refer to researchers who examined other insects*” (EV38/STD).

### **Learning from historical artefacts:**

The extract “*...without researchers who have done research before me in that area I wouldn’t be able to [do] this*” (EV255/STD), is further testimony that students relied on knowledge embedded in historically developed artefacts. Students extended knowledge boundaries by interacting with knowledge that already existed as suggested below:

“Yeah! you don’t have to start from scratch, if somebody has already done it, why should you start afresh?” (EV4/STD).

### **Cross-disciplinary knowledge sharing:**

Using knowledge from a single discipline may not be adequate in solving contemporary problems. Most problems are complex, ill structured and would require solutions that cut across disciplines. In seeking such information, novice researchers interacted with individuals from other knowledge areas and cited sources from foreign disciplines as shown below:

“I’ve had to understand material in fields different from entomology but which explained certain aspects that I discussed” (EV172/STD).

Learning new work ethics, ways of accessing information, techniques for conducting lab experiments and use of technology all constitute learning opportunities. As one participant suggests:

“It has been a great learning experience with ups and downs. There were multiple new things to learn, from work ethics, search techniques, laboratory techniques to computer software” (EV61/STD).

### **Summary:**

Research students consulted cultural artefacts developed over years which contained domain knowledge and constituted study area’s objects that mediated their research activities. New meaning and understanding were, therefore, consequences of interacting with artefacts. This section addressed RQ number 1.11.2 (i).

#### **4.4.5 Mutual engagement**

Students learn by interrogating peers on certain research issues. Dyadic conversations serve as platform for launching claims and expanding on the ideas. The following extract is an expression of mutual engagement to share tacit knowledge

“...I share research ideas with an office mate on what research designs I would use and why? Why would one have to use an eye tracker for data collection?” (EV53/STD).

Such a conversation is indicative of the collaboration that ensues among participants as they mutually engage in research processes.

### **Shared perspectives:**

Through interacting with peers and research community, students potentially accessed tacit knowledge of peers. This tacit information helped in explaining some research phenomenon. “... *never get enough of other people’s thoughts and opinions, people will always have different viewpoints*” when discussing research issues,

### **Scaffolding:**

Engaging with more experienced researchers helped novices reach higher cognitive capabilities through shared meaning (see ZPD in Section 1.12.1). The extract below documents how a more experienced learner scaffolded a novice’s understanding of some research issues:

“If I have certain results which I cannot explain, a more experienced lab user may help. Sometimes during general discussions on our study animals, people may mention facts that help you understand your observations better” (EV177/STD).

Practitioners such as supervisors possess tacit knowledge about research processes crucial for novices’ learning of research processes in informal social contexts. Participants consulted their supervisors and peers for support and research insights, as alluded below

“I am in close communication with my supervisors. I should know their thoughts, and the direction of their research. It have also kept in touch with other research group members (EV26/STD).

### **Social gathering as democratic spaces:**

Informal gatherings are ideal arenas for the advancement of research discourse. Unlike formal settings, which impose pressure on learners, the social environments are relaxed, and this helps in exchange of lessons learned. Presumptively, the power distances activated by knowledge asymmetries are reduced in social places where knowledge is communally shared:

“With lab users we have weekly meetings, or work in tandem in the lab. The research group meets periodically” (EV45/STD).

In the following text, students engaged with multiple research topics and learned from each other.

“I gain more from discussions especially in the Scarab Group, because they discuss many things useful for my own project”(EV34/STD).

### **Knowledge distribution:**

Each individual in a community brings in their own experience and own perspectives. When learners meet, the inert knowledge they possess is shared and new knowledge is constructed through recombining tacit-to-tacit knowledge:

“...no one knows everything or no one can think of everything. So other people can give their input” (EV135/STD).

When learners express their subjective mind and reflect verbally or through some acts, their inner thoughts become exposed and available to other learners. This triggers peers’ prior experiences causing conversations to ensue among groups and prior knowledge is changed.

“My supervisor suggested that I include biogeography in my discussion section (an article). For me this was a totally new area and required extensive search for. During a research group’ sorting session I talked about it and I was directed to the most relevant texts, articles” (EV37/STD).

### **Collaborative relations:**

The relationship between the supervisor and student may be collaborative. The novice, introduced into the research practice, learns as well as works on legitimate research problems. At masters or PhD level, students and supervisors may collaborate in research and compare notes on the outcomes of their individual research.

The following extract shows evidence of legitimate peripheral participation (see Section 2.6.6). The student was introduced to what the supervisor was already working on and through research activities; they worked on legitimate problems from the beginning. As the student states, “*I have been working on so initially I was just using her protocols*” the word ‘*initially*’ implies that eventually, she assumed ownership of the research. The student was scaffolded through the use of the researchers’ work and socialised into systematic scholarship. Therefore, through

engaging with supervisors, the novice student was exposed to the activities of the research practice and immediately engaged with the knowledge and community. Thus, she became a legitimate participant of the community as she worked on legitimate activities of the practice from the first time she joined.

“My co-supervisor was working on other phylogeny in the subfamily that I have been working on so initially I was just using her protocols and... the methods that she uses ... some specimens or species that are particularly difficult,”(EV38/STD).

In the following, a student relates how she and her supervisor were able to engage through collaborative research activities resulting in desired outcomes:

“...I was quite indistinct as to what I was going to do but then my supervisor came forth with ideas and funding and then I went on that path. So it was a collaborative experience coming up with the question as well as the methodology” (EV210/STD).

### **Collective intelligence:**

The following extract presents beetles as artefacts and objects of research study and from them, students discussed and negotiated knowledge related to their discipline or practice. When students discussed the ‘beetles’, they shared insights and discipline knowledge related to the specimen. Collectively, new knowledge was constructed.

...Because most likely on that person’s table there will be a tray of dung beetles and then they’ll start talking about them, where they were found,. So it’s better than being by yourself” (EV36/STD).

Novices are not *tabula rasa*, therefore, prior knowledge retrieved from long-term memory provides the foundation schemata for the construction of new knowledge in social environments where learners share their prior experiences with others (see Section 2.3). This constitutes shared repertoire, in which tacit knowledge is viewed as a repertoire of experience.

During research study, novices learnt as they socially engaged with peers and experienced researchers. Communities provide environments and structure for individuals to learn from each other by exchanging different methods and techniques on how to conduct research.

Even though there may be learners who learn best isolated, joint knowledge creation is always better than isolated research without support from others as reported below.

“It has been useful to collaborate with departmental staff with whom I share the lab. One can always learn something be it techniques, strategies, their challenges and their redress” (EV44/STD).

Experts and novices negotiate new meaning (*negotiated enterprise*) from the research repertoire and from their interactions to solve the problems jointly.

### **Summary:**

Through mutual engagement, students were able to create their own artefacts, construct knowledge, and create meaning from the communal resources.

In the next section, I analyse the challenges participants experienced. Given their volume, have their synthesized discussion is more informative than categorizing them, given constraints of writing space.

## **4.5 Postgraduate students’ learning challenges during conduct of research**

Students experienced various research challenges as they conducted their research. In addressing them I give effect to RQ 1.11.2 (ii) “*In relation to their projected outcomes, what learning challenges do postgraduates face in their conduct of research and how do they address them?*”

### **4.5.1 Novice learners’ research challenges**

#### **Limited access to resources:**

Some students struggled to access supervisors who were heavy laden by administrative roles and their own research undertakings. As a result, inadequate time was left for mentoring students. Another related problem was the increased number of student intake that further exacerbates the supervision problem by increasing the supervisor-to-student ratio (see Section 1.6.3 and 1.6.4).

Student voiced the following: “*Experienced researchers are not always available*”, “*reading around without elaboration on why one chose a specific theoretical framework is always difficult*”, “*...our supervisors are busy people*”, and “*Experienced researchers do not just volunteer to share...*” These indicated lack of mutual engagement with supervisors necessary for learning research skills. It implied that engaging with research informational resources alone was not adequate. As an alternative, students relied on informal, social interactions with peers and other knowledgeable individuals to learn research processes. Availability concerns were expressed by participants.

“Experienced researchers are not always available to the newcomers. They be busy or away doing field work” (EV181/STD).

“For a purely research course, the supervisor is never willing to lecture a student on such issues,” (EV18/STD).

“Experienced researchers do not just volunteer to share, there has to be some trigger. , e.g. , , a new researcher struggling with something and bringing it to the fore,”(EV204/STD).

### **Limited learner background knowledge:**

Student researchers often lacked research experience, and this resulted in students redoing substantial parts of their reports:

“Yes, when a whole chapter of my proposed research fell off because of wrong assumptions that had been made” (EV1/STD).

“You would compile avoluminous literature review wand the supervisor after reviewing it suggests that you haven’t presented your ideas clearly, so you rework the whole thing?”(EV2/STD).

### **Lack of critical research skills:**

Some students lacked critical reading skills when they embarked on their research. Such drawbacks, however, became opportunities for learning research processes. Through constant social interactions with peers in research activities, novices incrementally gained critical reading knowledge vital for their research. As one student attested:

“...the principal challenge of being critical you know, yeah because now I can take somebody’s work and criticise it ...”(EV9/STD)

Some students embarked on research without drafting and following a set plan, and therefore experienced challenges of focusing research and defining the studied problem early on before formulating RQs.

“At times you have much to accomplish in research work and you are mixed up. You know you should do something but you don’t know what” (EV98/STD).

The following extract may be treated as relating to ‘*learning as experience*’ and ‘*shared repertoire*’ in that “*narrowing down and focusing on issues which was my area.*”, The student needed to have the experience to construct meaning in the discipline.

“... the problem is formulating research questions because there is much that comes in your mind about phenomena, but not everything that you gonna [going to] tackle. The challenge was narrowing down and focusing on issues”(EV13/STD).

Logical research may involve foregrounding subjects or topics researched before or topics of one’s interests. From these, it may be easier to find literature pertaining to similar research. However, lack of literature should not limit carrying out a research, as literature from other fields can be customised in a different discipline or context. Some participants were faced with such dilemmas:

“I think researching an area where you have great interest in is important ... –A lot of time, money is invested and if you’re not motivated you may stop everything just in the middle” (EV216/STD).

In addition, students discussed the possibilities of including both qualitative and quantitative analysis (see EV332 – EV345 in appendix).

### **Access and power relation issues:**

The students who were participating in the KAR had varying research backgrounds and this played heavily on the social interactions on the KAR. The students with ‘weak’ technological background, and with research knowledge, shied away online participation. However, as EV201/STD indicated, some students perceived the KAR as a platform where they would freely express themselves compared to conversing with their supervisors. This scenario indicated the skewed power relations that are at play when novice students and experienced



researchers interact. This power asymmetry potentially frustrates joint enterprise and mutual engagement, which are critical to CoPs' sustained existence.

African countries have problems where students come from different backgrounds where they didn't have like access to knowledge or access to education, so communities that scaffold those students are invaluable (EV20/STD).

## 4.6 Chapter conclusion

The chapter presented some evidence of findings from the student researchers who participated in this study. The analysis used social learning theory and CoP concepts as the analytical framework. The analysis was structured into two categories of evidence collected from KAR, and from interviews and questionnaires. Each of these was then sub-categorised into seven sections, which formed the analysis themes. The following chapter discusses these findings.

## Chapter 5: Discussion

### 5.1 Introduction

From a student researcher's perspective, the study examined how students use the social learning environments to leverage academic supervisory support they got when conducting research. These findings are not generalisation of social learning of student researchers in online-mediated environments. Rather they point at issues demanding rigorous analysis in higher education regarding the postgraduate research processes and how online social learning tools can scaffold the learning of research processes.

This chapter provides discussion of a broader meaning of findings, and attempt to fit the findings into the larger *social-constructivist* perspective (Creswell, 2008, p. 57). Wenger's (1998) CoP theory and social learning theory provided the analytical framework for analysing informal learning of novice researchers. The framework was guided by the following constructs: *learning as belonging*, *learning as doing*, *learning as becoming*, and *learning as experience*. Further, the following CoP dimensions were used: *mutual engagement*, *shared repertoire*, and *joint enterprise*. Some constructs like learning as belonging and mutual engagement featured more prominently than other constructs.

### 5.2 Social Constructivism

Vygotsky (1978) posits that an individual's learning is situated in a community and knowledge is socially constructed, thus learners may not function isolated from the support structure of a community. When doing research, short- and long-term communities are formed in which learners interact and exchange research insights. It is through engaging with others that a learner develops (see Sections 1.9 and 1.12.2).

The evidence presented in Sections 4.3 and 4.4 showed that students and more knowledgeable research participants engaged in the web tool and in other *fora* by sharing their knowledge. These interactions were testimony of social learning in informal environments. Informal environments, both on and off line went beyond discipline boundaries enabling informal

mentoring of novices. “*The learners’ consultation base enlarged because every learner had access to every other learner through a common environment*” (Ng’ambi & Hardman, 2004, cited in Ng’ambi, 2004, p. 147). It is thought that learning is through the process of interactions and negotiations and co-construction of meaning (Hull & Saxon, 2009). The findings did suggest that students constructed meaning by negotiating their own tacit beliefs and the perspectives presented by other participants allowed joint learning. Novice researchers posted their research challenges and other problems related to learning research processes, see Appendix B references: EV295/STD, 298, 311/STD, 313/STD, and 320/STD. This attracted responses from fellow peers and experienced participants (e.g. EV301/SUP, EV303/STD, EV315/KR, and EV316/KR, EV323/KR, and EV344/SUP) who provided insights, ideas, and knowledge based on their own experiences. Some help on the online KAR came as references to material that students could use to gain research knowledge and to help with research (EV322/SUP, EV333/STD). In the remainder of this chapter, I discuss the findings divided into the CoP constructs.

### 5.3 Learning as doing – *practice*

The ‘*learn as doing*’ construct from Wenger’s four social learning constructs was evident in the student’s research activities as indicated in Sections 4.3.2 and 4.4.2. Through the legitimate peripheral concept (see Section 2.6.6), and through participation in a social environment, students learnt from their own research practice experiences (Ref: EV186/STD, EV219/STD). Though being novices in the research practice, the students were involved in authentic research studies that had the potential to inform world phenomena (Warhurst, 2006). They were actively involved in processes where they negotiated and debated new ideas along the process learning new research knowledge. A historical power dimension exists in the traditional research practice, and this was evident between the student-supervisor relationships. From evidence (e.g. EV153/STD, EV174/STD, EV208/STD, EV219/STD), the supervisor was highly regarded as a person who provided the much-needed guidance and mentoring during the research process. Historically, members of the historical structure provide the needed formal perspectives, while individuals in the informal SLE structures offer voluntary advice that augments the formal structures. The new practice in a SLE may have

shifted the power structure as novices relied for some insights from the non-traditional sources in addition to traditional authoritative structures. Some of the ‘*shared historical and social resources*’, ‘*frameworks*’ (Wenger, 1998, p.5) students engaged with included the historical concepts that are part of the research historical repertoire.

## 5.4 Learning as belonging – community

This construct was the most evident in this study, and its discussion is hence longer than other constructs. The evidence suggests that students learned from other participants in the research environment through socialisation (e.g. EV55/STD, EV177/STD, & EV293/STD).

### **Community dynamics influencing learning:**

The *community* emphasises learning as belonging. The dynamics of a community in which the individual belongs influence an individual’s learning. Being a member of a community is “*an intrinsic condition for learning*”, therefore, by participating in a “*distinctive practice of a specific community*”, learning is unavoidable (Warhurst, 2006, p. 114). Thus, as expressed by participants, learning as belonging was the most prominent from collected evidence. As one student expressed that

“...in a community you learn through each other. ...Because in communities of learning, different people tell their journey, then you learn from them” (Ref: EV55/STD).

### **Learning in relation with others:**

Like socio-cultural and activity theories, the community concept punctuates social learning (Quintos & Civil, n.d.). The difference with the other theories is that the concept of community “*positions the interactions, discourse, norms, and meanings in light of the relationships among members*” (p.4) less foregrounded by other theories. This co-operative learning from a community is evident from the responses gathered from students and some extracts in Sections 4.3.1 and 4.4.1. In this study, students were involved in formal and informal CoPs whose distinctive practice was research. Notwithstanding the perception about the supervisor by some students, the ‘*sense of community*’ that was experienced was that learners could interact,

seek information, and form relationships with anyone from the research community (Brook & Oliver, 2003).

### **Participants as agents of cross-discipline knowledge transfer:**

These communities are characterised by provision of resources to afford participation and through research activities, the research norms and rituals are modified to fit within new situations. The study's participants, drawn from more than one discipline, acted as domain agents and as brokers between domains (EV104/STD), passing shared information back and forth (Wenger, 2000). Knowledge diversity was activated by knowledgeable researchers who shared their experiences internalised over years of practice, and the novices brought into the community their new experiences.

### **The KAR mitigating learner isolation:**

The contributions and interactions that ensued created a sense of community and belonging (Quintos and Civil, n.d). Some students identified isolation as a possible challenge when conducting research. However, studies have shown that socially networked people and online spaces provide environments that encourage knowledge construction and sharing through social interaction (Bonk & Wisner, 2000; Hiltz, 1998; Palloff & Pratt, 1999). Samara (2006) reports that research students may experience academic isolation during research. Evidence (EV36/STD and EV150/STD) showed that students were often isolated and needed the support of a research community. As expressed in EV36/STD, EV150/STD, EV216/STD and EV217/STD, communicating research challenges and getting responses on the KAR online tool mitigated students' isolation and forged artefacts development and learning (Brook & Oliver, 2003, p. 140).

### **The KAR enabling learning:**

The KAR enhanced participants' sharing of their experiences, as it provided the essential environment for meaningful engagement. The tool transformed into a learning community, a context where the tone of peers was peer coaching and support from mentors which encouraged learning. The KAR exhibited asynchronous and anonymity features that

encouraged dialogue from participants. Online tools that promote asynchronous interactions are advantageous in that participants are allowed time to reflect and review their conversations before posting (Hull & Saxon, 2009). The dialogues/postings by participants were electronically preserved by the KAR thus providing a digital trail that learners could revisit these at any time.

### **KAR promoting distributed cognition:**

The KAR provided a setting for distributed cognition. Bronack, et al. (2008) provides three attributes for distributed cognition, namely: (i) learning communities containing people with varying backgrounds and levels of expertise, (ii) technology which supports communication and productivity within the community, and (iii) engagement in authentic activity (Bronack, et al., 2008, p. 64).

### **The KAR supporting distributed supervision:**

Two of the four problems identified in Sections 1.6.3 and 1.6.4 in Chapter 1 are “*some challenges in the research-mentoring model*” and “*increased enrolment in higher institutes of education*”. To overcome these problems, students turned to SLEs to augment the assistance they received from their supervisors. Some interactions in the SLEs mimicked those offered by supervisors in the traditional supervisory settings, but occurring in informal learning environments. Therefore, the supervisory and mentorship capacity of peers and other knowledgeable researchers tended to extend the traditional supervisor-student relationship. As such, the supervision role was distributed to peers and knowledgeable researchers who understood these challenges. It turns out that these social contexts were a motivation for novices to learn (see for example evidence EV29/STD, EV54/STD, EV149/STD, and EV227/STD also presented in Section 4.4.1. One main effect of such an informal supervisory model is that participants were able to gain research knowledge and had exposure to perspectives of many individuals in a social context that extended beyond academic staff.

To further indicate the importance of *learning by belonging*, the following subsections extend the discussion.

#### 5.4.1 Depending on others to learn and research: a sense of community

One of the benefits of gainful interactions is a reciprocal exchange of information amongst participants. For Nonaka and Takeuchi (2000) the conversion of knowledge through reciprocal learning (tacit-to-tacit knowledge) is called “*socialisation*”, where learners share experiences in creating common meaning. Through practice and interactions with the world objects, learners internalise their experiences. Tacit knowledge, in the form of experiences, which resides in long-term memory, provides the foundation schemata for the construction of new knowledge for individual learners. When claims made in discussions are analysed, some hidden meaning that might make sense in resolving problems is revealed for a collective construction of meaning (EV337/STD & EV338/STD).

Belonging to informally constituted groups of researchers provided students with ‘*spaces*’<sup>8</sup> for ‘*learning as belonging*’, peer groups, where they met, presented their research progress, and discussed research topics, were created. Students exchanged ideas through face-to-face and KAR online interactions with each other and by so doing learned research processes through others’ perspectives. It was through these multiple perspectives of the world, which were concentrated in discussions, that the research puzzles, which could not be solved by isolated learners, would be resolved through joint meaning making by a group of researchers (Brook & Oliver, 2003).

##### **Online interactions:**

These interactions took place on the KAR, which was discussed above in this section. The offline and online interactions were mutually constituted through the KAR setup. There was reciprocity as discussions would originate in one environment and extend into the other, thus the environments complemented each other.

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<sup>8</sup> See Section 1.5.2 on discussion on ‘*spaces*’ in the context of this research

#### 5.4.2 Supervisor-student relations

Supervisors were regarded as mentors and experts who guided and did not dictate to students. They were supportive, their role in the research process was fundamental to student's success (EV152/STD, EV174/STD, EV219/STD, and EV232/STD). Giving students the leeway to determine their learning process and the direction their study would help develop students cognitively (Douglas, 2000; Warhurst, 2006). This would allow students to consult widely in the research community and would not be restricted to vertical discipline knowledge.

#### 5.5 Learning as becoming - *identity*

As students participated in the socio-cultural activities that led to learning research processes, their identities transformed during research 'rituals'. Having a '*shared learning experience*' helped them create an identity (Douglas, 2000, p. 157). They claimed to have gained analytical research skills and were better academic writers (EV197/STD, EV66/STD, and EV101/STD). These metacognitive claims were statements of self-evaluation and subjective classifications, in a way identifying self with the knowledgeable members of the research community. The claims indicated transformations that would have occurred from being novices to individuals with authoritative knowledge in the research community. Thus in a practice, novices gradually transform into 'becoming' discipline experts, and becoming more competent.

#### 5.6 Learning as experience – *meaning*

The *meaning* construct of the social learning theory was not that prominent in the KAR tool and from the interviews conducted. However, Hibbert (2008) states that there are always multiple perspectives when it comes to interpreting the world phenomena and meaning making, depending on how one perceives the world, diversity of views in learner conversations helped in solving problems, and new knowledge generation (see EV289/STD). As Newman et al. (1989, p.2) cited in Douglas (2000) state:



“When people with different goals, roles and resources interact, the differences in interpretation provide occasions for the construction of new knowledge (Douglas, 2000, p. 155)

As noted, learners perceive the world differently and make claims based on these perceptions. Meaning and interpretation of phenomena was negotiated as individual students consulted peers and experts in the online tool (EV227/STD). Presenting one's challenges, requesting for help from other community members and the recursive threads resulted in exchange of information, hence joint meaning making. Two threads about how to write literature reviews (EV320 – EV326), and a discussion on use of qualitative and quantitative evidence in the analysis section of a research (EV332 – EV345) were typical examples.

Individual perceptions may be incompatible with other people's views, but reconciliation leads to social mediation of individual knowledge. Through interactions, learners offer their perspectives and hear others perceptions then create their own mental interpretation of phenomena (EV57/STD). Eventually, through such a process, a commonly shared meaning develops within the research discourse, thus reconciling the initial incompatibilities. A definitive agreement may never occur, as there are other potential interpretations of world objects. Understanding, truth and validity are more important for an action in communities. Communities use the facts that they agree upon to progress the discourse (Bereiter, 2002;

### 5.6.1 CoPs providing multiple perspectives

In Section 1.6.2, “*Limited realisation of Learners' varied perspectives*” was identified as a problem of traditional supervision. CoPs provide supportive structure offering *multiple* collective perspectives. The various views or *perspectives* would generate “*rich discussions and critical analysis*”, obliging participants to entertain new thoughts about research practice (Hibbert, 2008, p.140). Online CoPs provide a platform for participants to express themselves and exercise their collective capacity to construct a repertoire of research experiences that contribute to binding researchers into a community. It functions as a purposeful medium for the professional development of researchers and the research process.

The contributions by community participants offered different perspectives of the research practice. This provided multiple zones of proximal developments (ZPDs) in that peers were able to draw knowledge from the collective meaning making of the social learning community. As indicated in some of the evidence EV71, EV121, EV129, EV135, EV154, EV162, and EV177 (all with /STD suffix) which showed assistance from peers and others, had an effect of greater success compared to a researcher working in isolation (Muukkonen, Hakkarainen, & Lakkala, 2004).

Such online environments encourage 'transformative learning' (Mezorow, 1991 in Xie, et al., 2008). The insights shared on an online tool encouraged learner and research practice growth (Xie, et al., 2008) as suggested in the following participant's except.

"...you are researching so that you develop some conclusions, you've solved something in that area or to developed new knowledge" (Ref: EV261/STD).

According to Mezirow (1994, p. 763), the implications of meaning making for learning is the "*notion of perspective transformation ... learning is defined as the social process of construing and appropriating a new or revised interpretation of the meaning of one's experience as a guide to action*" (cited in Krauss, 2005, p. 763). When people learn, existing conceptions of meaning are challenged; this raises opportunities for the acquisition of new meanings or may serve to affirm presently held views (Krauss, 2005). This was evident when a student discovered that she was inflexible to new knowledge. In EV100/STD, a student realised she needed to adapt to new knowledge she was exposed to in her research.

## 5.7 Mutual engagement

As Wenger (1998, p. 76) suggests, "*it is more important to know how to give and receive help than to try to know everything yourself*" Students were aware of this behaviour as shown in (EV135/STD). Judging from insights and ideas students contributed, they developed multiple perspectives. We inferred that knowledge does not reside with single persons, but is spread amongst peer groups (EV54/STD and EV57/STD). CoPs support multiple perspectives to advance common meaning making processes. However, it is experienced individual's responsibility to share the knowledge they possess, and it is the prerogative of any individual to terminate

membership of a community (Brook & Oliver, 2003). Therefore, there is a possibility of knowledgeable learners withholding knowledge as a form of power retention as evidenced by students' claims about individuals' rational decisions on whether or not to partake in the community depending on expected benefits (see EV75/STD, EV76/STD).

## 5.8 Joint enterprise

With joint enterprise, participants were accountable to the community's continuity by negotiating meaning in light of problems to be solved. Students had a shared enterprise to learn research processes. In response to this, students indicated that they were committed to learn the research processes to achieve their research goals. Examples included participants who expressed passion about their research studies (EV36/STD).

Moore and Brooks (2000) expressed commitment to helping each other as a characteristic. Interactions amongst participants showed this commitment, in addition, students were *"...thankful for quite useful responses from the other postgraduate students"* (EV335/STD). Such interactions were indicative of social responsibility and accountability to others and the community.

Participants engaged in various *fora* that included peer groups (EV293/STD), joint execution of research activities in laboratories (EV44/STD), and discussing challenges on the KAR to create common meaning for the benefit of the community. All these were an indication of learning communities and helped in fostering a shared understanding of research processes.

## 5.9 Shared repertoire

CoPs provide members with structure for social learning and enable sharing of stories from practice and learning from each other. Members received informed critiques, which triggered further reflection on learner perspectives (Hibbert, 2008). The postings on the KAR and the transcriptions of interviews and questionnaires presented in Chapter 4 gave a rendition and meaning student researchers made from their learning experiences.

According to Xie, et al. (2008), “*reflection is an important prerequisite to making meaning of new information, and to advance from surface to deep learning.... strategies such as journal writing and peer feedback have been found to promote reflection as well as deep thinking and learning*” (Xie, Ke, & Sharma, 2008, p. 155). In light of this, the idea of a KAR was to facilitate sharing of research experiences by participants, and co-participants would give feedback on peers’ postings, and expert researchers contributed by sharing their experiences. The shared knowledge would trigger further reflections and this helped create joint/collective meaning providing alternative perspectives that would determine actions taken by learners (Hibbert, 2008).

As students mutually engaged through interaction, they created artefacts, which accumulated over time. These artefacts became the explicit cultural tools that embed historical knowledge of research activities (the practice). The KAR overcame the limitations of time and space, which are characteristics of traditional models of sharing knowledge. The artefacts were persistent and available to the community without formal restrictions (Ng'ambi, 2004). The created artefacts were context free, and acted as discussion points that activated the process of creation, renewal and redefinition of knowledge (Boyd, 2008).

## 5.10 Student challenges when conducting research

### **Challenges on interpretation of studied phenomenon:**

Research processes generally follow traditional and scientific methodologies to maintain research quality. Students experienced challenges in formulating a research study that was methodologically sound, and reflected research quality. Research quality includes its credibility, validity, dependability/trustworthiness, reliability, and transferability (Creswell, 2008). All except for one student did not adopt an interpretivist research paradigm, which allows individual expression through own writing style and structure. In most cases, students failed to develop logical arguments beginning with research question formulation, stating unambiguous problem statements and defining the purpose of study (Ary, et al. 2006). These challenges often triggered misinterpretations of studied phenomenon and ambiguous conclusions. This way the researcher may misinform target audiences.

**Challenges of triangulation:**

Lichtman (2006) discusses methodological triangulation, used to improve on the quality of research. The assumption is that corroborated evidence will emerge from using a combination of methods (Ary, et al., 2006). Beyond this, quality is measured in the ability of the researcher to articulate successfully his/her methodologies and produce convincingly rich arguments of findings. Students experienced some triangulation challenges as they conducted research. They reported some difficulties in balancing qualitative and quantitative research elements (see Section 4.5 in Chapter 4).

**Challenges on application of methods of study**

Lichtman (2006) discusses the controversies between “*conservative and more traditional*” research reviewers who still believe in “*traditional research methods*” (p. 189). He observes the inflexibility of traditional methods and new developments where mixed methods are becoming common. New developments may require mentors to be conversant and multi-skilled in numerous and varied aspects of the research field. Given that an individual mentor/supervisor may not know everything; supervisors can benefit from distributed cognition offered by research communities.

**Challenges of understanding domain knowledge and research processes:**

Most inexperienced participants (see Section 3.5.3) were undertaking a research study for the first time at graduate level. They were compelled to understand research processes and problem domain they were researching simultaneously. This presented a situated learning scenario, and the main support structure was, therefore, their peer-based learning community and supervisors who helped them construct knowledge through formal and informal interactions.

## 5.11 Discussions of some implications

### 5.11.1 High rate of engagement

Sections 4.3 and 4.4 provided some evidence that students depended on input from others as they conduct their research. Graduate students indicated that a community with mediating environments could be useful to counter solitude. They engaged in extensive consultations and interactions with supervisors, peers, other academics, scholars, work colleagues, friends, and other individuals in various isolated conversations, Appendix B provides further evidence that includes EV57/STD, EV142/STD, EV285/STD, EV293/STD, EV297/STD. The interactions between the novices and other researchers helped shape the novice's learning trajectory, offering insight and knowledge required to solve research challenges. The contemporary students' profiles are becoming those of immersive digital learners; learners rely on technologies for their everyday activities including learning. The participant's were highly connected through online and offline social groups with a high level of interactive activities as indicated by the peer groups, and general group discussions that went on during their research (EV26/STD, EV34/STD, EV37/STD, EV45/STD, and EV54/STD).

### 5.11.2 Envisaged transformation of research processes

With the advent of new technologies the temporal, distance and the constraints between interlocutors is diminishing (Shapiro & Gonick, 2008). The traditional formal methods by HEIs of knowledge acceptance and recognition may transform, and embrace the growth of informal structures that are enabled by the proliferation of technologies. What is admissible as valid knowledge creation has always been viewed as the prerogative of the academics, and other knowledge production processes have been viewed as of "*low knowledge*" while those of academics as "*high knowledge*" (Cross, 1997, p. 83). This research advocated for a complimentary research mentoring function of students that augments the supervisory role of academic staff (high knowledge) by sharing the role with a larger informal community, considered as 'low knowledge'. Such communities create research experiences and knowledge in boundless social environments.

### **Distributing knowledge creation authority:**

A KAR made knowledge creation ubiquitous, anyone from anywhere in the research community could contribute to its creation and knowledge artefacts would be present anywhere. Cross (1997) argues that “*there are different epistemologies within and outside the academy and as such multiple locations of ... knowledge,*” and “*these epistemologies lead to different degrees of knowing or different bodies of knowledge*” (p.85). Focusing on the production of ‘history knowledge’, Cross (1997) states that:

“...the production of history and culture is not just a privilege of the academy but takes place in different kinds of settings: formal institutions of the ‘guild’ – forums, seminars, exhibitions, festivals, parades, workshops, symposia, conferences, lecture series and publication projects; in several public institutions such as library, the schools and curriculum, dinner dances, ...,”(Cross, 1997).

The point made and the significance of Cross’s text for this study is the link to liberalising the knowledge creation process to include arenas beyond the formal educational culture, to include open online research communities to leverage the traditional arena. Technologies such as the KAR add to the research milieu an online social tool that mediates learning research processes. In their social activities, most learners immerse in digital technologies. New blended modes of teaching and learning take advantage of available technologies

## **5.12 Reasons to explore other knowledge creation strategies**

### **5.12.1 A need to shift and share supervisor’s role**

As indicated earlier in Section 5.4.2, the perceived pivotal reference point for a student researcher is the supervisor (for example, see EV152/STD, EV210/STD, EV219/STD, and EV232/STD), as in general, supervisors mentor students during research. Warhurst (2006) asserts that in such a structured setting, students may be unable to develop skills to learn independently and “*for the practice or for learning socially from colleagues*” (Warhurst, 2006, p. 117). Any initiative to shift this normative setting to include various reference points may require formal shifts in the traditional consultation structure to supplement the mentoring role provided by supervisors.

In the social learning theory, each community participant is a legitimate practitioner and a potential source of knowledge from which others can learn. Thus, each individual is a learning agent or knowledge node, who may contribute valuable research knowledge in a research ecosystem, such as that discussed in Section 1.9. Communities of learning are thus options that may provide multiple supervisory and mentoring for a new researcher.

### 5.13 Research limitations

This section provides a brief narration of some limitations.

Selwyn (2000) emphasise these challenges (a) when online communities' participants are not committed to each other or the discussion forums, their activity decreases eventually. (b) Individual's fear that the postings they place in the community will be criticised by peers (Tremblay, 2004). (c) The period that the community is given to form and for participants to bond and trust each other, could negatively affect a CoP's success if it is short (Selwyn, 2000). Point (c) above could have had a larger bearing on the level of participation, and the other two points (a) and (b) by Selwyn (2000) had varying influence on activities on the KAR as well.

#### 5.13.1 Social presence issues:

An additional factor is lack of online social presence. Social presence includes students' perceptions and how satisfied with and comfortable they are in posting their ideas, the connectedness to others, and the feeling of a sense of community online. Understanding the decisions that students or other researchers make to reply to postings on online learning environments contributes to the design of models used by educationists for online research communities to improve learning outcomes (Chapman, Storberg-Walker, & Stone, 2008).

From the interactions recorded on the online environment for this research, the KAR tool provided an alternative platform for researchers to exchange their knowledge. The tool provided options for uploading and downloading videos, audios, and for posting text. These provided for asynchronous exchanges as participants shared research insights. Murphy (2004) contends that provision of instructional tools does not compel participants to participate



actively online. It is thus important to understand the decisions of participants for respectable online research community activities.

### **5.13.2 The Hawthorne effect**

‘Hawthorne effect’ refers to original studies that were conducted on factory workers around 1924-1933 in America. The concern is on the outcome of a study/experiment when the participants are aware that they are subjects of study (Draper, 2010). In this study, the researcher knew some of the respondents at a personal level as these were at postgraduate together. The participants may have participated to help out a fellow student, and this may have affected their commitment on the KAR interactions.

### **5.13.3 Reflexive researcher effect**

Connolly (2003, p. 105) defines reflexive researcher as a “*self-conscious analysis of the impact of the researcher on the process of research*”, and can contribute to bias in research. As indicated in the research design, the researcher participated in the research as one of the contributors in the KAR, and also had to initiate the discussion by addressing student requests for help offline in the initial stages of establishing the KAR (see Section 3.6). This role meant that the researcher was an active participant in the construction of the artefacts of the KAR.

## **5.14 Chapter conclusion**

This chapter centred on interpreting the evidence, using the constructs from Wenger’s social learning theory. The findings suggest that student social interactions were a major factor in the learning of research processes. Indeed, an online tool was instrumental in mediating and providing a context for social learning. The success of a community was determined by the progress of the discourse binding the community (Bereiter, 2002, p. 353)

## Chapter 6: Study Conclusions

### 6.1 Introduction

The previous chapter discussed the findings of the study. This chapter presents the conclusion of the study. The chapter affirms the aim of the study, and provides a brief discussion on learning community's role in mediating a learner's knowledge acquisition. The research questions are reviewed including the research process and future research is suggested.

The process of research is usually an individual or group effort that does not follow conventional/traditional and structured formal learning environments. Traditional learning environments are usually rigid as they are constrained by a structured plan. However, research-learning environments are characterised by unstructured problems, and require flexible/adaptive learning situations. Novice researchers are contemporary learners who are generally highly social, hence the learning *spaces* need to be reconceptualised to cater for the actively social, participatory, and experiential contemporary learner.

The evidence showed that novice researchers learnt research processes *in situ* and in a social environment context. Through informal 'networks' of learners, some forms of social learning communities were created. In these social environments, students learnt research processes by interacting with peers and individuals more knowledgeable in research processes. Sustainable communities have a range of roles (Brook & Oliver, 2003). Each participant took on different community roles - 'mentor', an 'advisor', a 'learner', or a 'teacher' depending on activities one was involved.

The traditional supervision method characterised by a supervisor-student dyad mode was reported to present several challenges, which were identified in Section 1.6. The number of students enrolling for postgraduate is steadily increasing and this tends to exert pressure on the resources, including availability of supervisors to attend to mentoring students. In light of this, students seek other learning models to help in learning research processes and to succeed in their study. Social learning is an alternative where students learn through active interaction

with others in an informal and social environment. This research viewed graduate research students as novice researchers; and examined their creation of learning artefacts through research processes and learning from these artefacts in a social community.

## 6.2 The aim of study

The study investigated the extent to which social construction of knowledge helped novice researchers learn generic research processes as they interacted in a social learning research environment that provided space for learning and reflection. Further, the aim was to investigate the leveraging of traditional supervision by a social learning environment. An online tool was used as a learning environment to provide a context for the postgraduate student to conduct research. The research explored the extent to which these students learnt and shared research experiences in a social online learning environment in addition to the academic support that they got from their supervisors.

## 6.3 Learning community's mediation of student knowledge construction

For many students, a research undertaking is novel and the learning process does not follow the usual traditional classroom mode. Students have to work on independent studies where they determine how they structure their learning, and that of the study. The nature of the research processes is that those who are involved in it possess a critical and analytic disposition and have a creative aptitude for success. During the processes, new ideas and knowledge are created that solve complex societal problems. With such demands, novices needed the support of supervisors, peers, and other sources of knowledge. This study concludes that researchers needed to belong to "*collective movements*" that provided resources the learners would not have in isolation. These resources pertained to knowledge, advice, and support needed when undertaking a research study (Youniss, 2006, p. 313). Possible answers to the identified problems (Section 1.6) are found by encouraging development of learning communities as an extension or complementing structure to the formal institutional

supervision structures. These learning communities foster social constructivism, where knowledge is shared and construction of knowledge is through socialisation with peers

CoPs are characterised by learning and social sharing of ideas and artefacts to help create meaning of new knowledge through interactions that are formal or informal between experts and newcomers. They cultivate a sense of belonging and mutual respect (Li, et al., 2009). “*The social phenomenon of community is employed to enhance learning experience*”(Brook & Oliver, 2003, p. 140). This research study highlighted the phenomenon and these common characteristics were observable in the collected evidence. Continued research in CoPs helps in the development of interventions that operationalise, advance and optimise the characteristics of CoPs. Some of the possible interventions include use of technology tools that facilitate dispersed learners and communities to rendezvous virtually, online.

The study sought to answer the main RQ “*How does a SLE leverage the traditional supervision methods of novice research students?*” Related to this question are three sub questions. The main RQ and related sub-research questions are reviewed below.

## 6.4 Review of Research Questions

In this section, I review the research questions stated in Section 1.11.

### 6.4.1 How does a SLE leverage the traditional supervision methods of novice research students?

Student researchers, identified as novices, turn to informal social learning environments during their research study. These environments are composed of groups of individuals who are interested in research and are in a position to share their experiences with others. Wenger (1998) and Wenger et al. (2002) advocates call such groupings communities of practice (CoP), and learning is situated and occurs as a social process.

This study drew on Wenger’s (1998) social learning theory, conceives learning as distributed across intrapersonal, extra personal, and artefacts that are found in communities. Evidence presented in Section 4.3 and 4.4 reported that learning occurred in the social environment

context and that learning is situated in particular social and physical contexts (Wenger, 1998). Wenger's CoP and social theory of learning encompasses eight constructs: *community*- (learning as belonging); *practice*- (learning as doing); *meaning* (learning as experience); *identity*- (learning as becoming); mutual engagement; joint enterprise; and shared repertoire, which were used in this study to analyse learning in a social environment. Through informal interactions, everyone involved learns from others, and past experiences from all involved have a larger bearing on the learning trajectories of novices. An alternate yet complimentary option from the traditional research practices is provided in new forms of research practice that encourage social constructivism in a SLE. Such alternatives may use online environments. Through such informal and social environments, novice researchers enriched their research knowledge and were able to learn from peers and experts.

#### **6.4.2 What learning strategies do students use when conducting their research activities in a social environment?**

The learning strategies employed by students conducting research were '*learning as you do*' in a social environment where students interacted with peers, experts, and research artefacts. This study viewed research process knowledge from a community perspective, where knowledge is "*a social practice of knowing*" (Wasko & Faraj, 2000, p. 160). Learning and knowing relate to human activity and are linked to practice. The study showed that knowledge is context specific and communities such as the one explicated in this study embed knowledge distributed among the variables making up the community. New ideas on alternative approaches to research processes were shared within the community. ICT facilities such as the KAR can be used to facilitate and enable learning, mutual engagement, joint enterprise, and shared repertoires in COPs. Such facilities include technologies that enable synchronous and asynchronous interactions, formation of discussion groups, and chatting features that enable sharing of personal research experiences and topical issues relevant to research processes.

Unlike traditional supervisor-student closed discussions, the discussions enabled by the KAR were considerably public where participants in the KAR platform were able to respond and contribute to the discussions on an open platform. The contributions were traceable as the facility kept a trail, recording all conversations. This enabled participants to engage with the

build-up of knowledge regardless of when they joined the discussion. Such open discussions promote the community's common or mutual interest, and could further intrinsically motivate individuals to contribute their tacit knowledge. The knowledge embedded in individuals tends to be unlocked into the open space of a community for the benefit of sharing the individual knowhow with all, novice and experts alike. By posing questions on the open forum, novice researchers hoped to get feedback on aspects of research processes that were troubling them and hoped to get research ideas and learn on issues hindering progress of their individual research studies. Taking part in the KAR discussions helped participants learn from the research experiences of others. Face-to-face interactions tend to involve exchange of knowledge that is localised, however, use of the KAR enabled sharing of knowledge decentralised amongst participants with varying research knowledge.

With its asynchronous and synchronous capabilities, the KAR was able to overcome the limitation of distance and time constraints experienced by traditional supervision methods. The dynamism characteristics of the open discussions meant knowledge shared in the social research 'ecosystem' was continually being regenerated as new ideas were being introduced (see Section 1.9), keeping relevance of topics.

Understanding social learning processes will assist educators and designers to develop methods and educational tools that would help students' learning during their research processes. Student participants were allowed to reflect via online tools that enable anyone to post research experiences and other material. The tool provided learners the dexterity to exercise their skills and learning styles. They could freely self-express themselves in social environments that could enhance social learning. Studies may look into new models and learning paradigms that consider breaking with tradition in which normative power relations that influence research between the student, peers and supervisors are re-examined. Evidence discussed reported presence of social interactions of students when doing research in a social learning environment.

Understanding the strategies applied by learners when conducting research may inform HEI authorities in strategizing and implementing social environments that are flexible to accommodate the diverse learning styles of learners.

### **6.4.3 What learning challenges do postgraduates face in their conduct of research and how do they address them?**

From the evidence in Sections 4.5 students encountered varied research challenges that included limited access to resources that included access to their supervisors; limited learners' background research knowledge; a lack of critical research skills; power relations between themselves, supervisors and other knowledgeable researchers. To overcome these, they depended on input from other individuals in a community who had diverse levels of research knowledge. The interactions that ensued between and amongst these individuals generated knowledge artefacts through the claims made in the conversations. These claims were individual perspectives, which were manifestations of the learner experiences gained through interactions with world objects. Participants were drawn from different disciplines that had certain norms and interests binding their members together. The participants brought knowledge gained in their disciplines and transferred such knowledge through inter-discipline interactions. Such lateral interactions were vital for the solution of complex world problems that required a cross pollination of knowledge from a wider knowledge base that spreads across several knowledge disciplines.

In general, researchers are involved in various isolated conversations, and valuable knowledge generated in these conversation episodes may be lost or may not be accessible to other individuals who are not directly involved in these conversations, this may create discontinuities in knowledge advancement, thus creating knowledge voids. Harvesting these conversations and reflections into a persistent state, that is freely accessible and adaptable, creates a historical repertoire of research artefacts from which old and new researchers may learn and further the knowledge.

Understanding the challenges that novice researchers go through when conducting their research would help in directing effort by educators in HEIs towards designs that facilitate mitigation of research challenges.

#### **6.4.4 What role would a Web-based information harvesting-tool play in the research activities of students?**

Sections, 4.3.1 and 4.3.2 indicated evidence that answer this question. Web tools provide open environments that eliminate the time and space limitations associated with traditional mediating environments that do not employ web technologies. As indicated by respondents, there is a constant increase in the use of online technologies and students now rely on these to learn. Online tools can act as pedagogical research instruments that help students learn research processes. In addition, online tools act as mediating-platforms where learners in communities can express their ideas. As learners dialogue, they leave a trail of shared electronic artefacts online, which become ubiquitous, and permeate a greater part of student communities conducting research. The persistent recordings on these tools keep participant's externalised experiences and reify these experiences in the form of various electronic media. Accessing these empower users and could help solve or trigger and guide thinking that might generate the required knowledge to solve challenging issues that newcomers and old-timers in research encounter. As a community of novice and experienced researchers interacted and exchanged knowledge online, a repertoire of artefacts developed and was accessible from anywhere, anytime and was permanently available. Over time, these novice and seasoned researchers would come and go and their contributions and their innermost thoughts would be reified into explicit objects as their reflections remain within the community as research artefacts that can be readapted to solve recurring problems (Li, et al., 2009). Such artefacts provide a historical recording of knowledge and knowledge transitions as new developments in the research community evolve.

This research, therefore, found that use of web-based information harvesting tools encourages creation of learning artefacts that help learners. Implementing these tools would therefore enhance the learning experiences of novice researchers.

The findings of this research on use of online communities should help improve the effectiveness of learning research processes and the transfer of knowledge amongst peers and expert researchers through social learning environments. Communities provide multiple ZPDs, which mitigate the supervision and other identified research problems. Communities



also provide a social platform to be active, creative and to think critically about phenomena with help from other people.

## 6.5 Implications for the study

The advent of technological proliferation has brought in behavioural changes to today's students. The expectations and attitudes of a contemporary student differ from those of previous generations. Today's students are more social and more participatory than ever, hence the learning spaces that are designed today should cater for the research student of today. Institutions and supervisors should have a paradigm shift to understand the new learning styles and preferences of research students whose learning approach is centred on social participation. Face-to-face conversations may not be eliminated because of the entrant of online technologies. However, supervisors should gradually incorporate the technologies that have become second nature of their students. These technologies have become the 'living and learning' space of students. An increased presence of supervisors in these 'living and learning' spaces would reduce the limitations of the traditional supervision methods.

Some problems researched are complex, and they require perspectives from across multiple disciplines. Solving these problems would require joint enterprise in an inclusive social space. Sharing the knowledge would help learn and solve the problems. Social constructivism is learning through active participation in cultural activities with others, and knowing is distributed among learners. Supervisors can take advantage of social constructivism principles to distribute their roles to the learners in such spaces.

Therefore, designing and implementing solutions that cater for the different learning styles of learners who participate in SLEs would mitigate the challenges found in traditional supervision models. Technologies have been found to promote development of communities and learning in social environments. Studying learner behaviours and learning preferences may lead towards implementing technological solutions suitable for socially inclined learners.

## 6.6 Review of the research process and Lessons learned doing this research

On embarking on this research was fraught with many drawbacks, which included a limited ability that I had to conduct a research study based on the interpretivist paradigm. My computer science background did not prepare me for a qualitative approach. This then meant a steep learning curve which coincidentally required the support of social learning environments. The interactions I had with my supervisor, peers, and other academic staffs was valuable for my learning process. Thus, undertaking this study helped me to understand qualitative research. Through the help of peers, I gained knowledge on how to use some of the tools such as NVivo, and audio editing software, used in qualitative research. Another notable knowledge attainment was that my academic writing skills were improved by accessing other writer's work, consulting with knowledgeable researcher writers, and seeking guidance from the supervisor and other researchers. I now consider myself a more knowledgeable individual and identify with qualitative research

## 6.7 Suggestions for future research

In this section the researcher reflects on possible future research studies related to what has been highlighted in this study.

### 6.7.1 Future research on use of CoP theory

This case examined and highlighted shortfalls in traditional supervision method of research, the challenges of novice researchers, and learning possibilities through socio-constructivist principles. Today the proliferation of online technologies has seen behavioural changes of students, who have become more social on a global scale. The removal of time and space by technology has meant that students form globally connected social networks. From the premise that students working together enhance their individual cognitive development and the distributed knowledge nature of communities enhances collective intelligence, social presence, and other factors that enhance learning. It is prudent that more studies on

development of CoPs for research should take prominence, in particular studies related to virtual and distributed CoPs of research processes.

### **6.7.2 Future research on social learning in research knowledge acquisition**

Instructional guidance in well structured environments such as conventional schooling models has been well researched but there is lack of adequate empirical evidence with regards ill structured environments (Spiro & DeSchryver, 2009) such as social environments. It has been shown in this study that meaningful interaction takes place in social spaces, and these produce social learning artefacts. Modern society learners are increasingly becoming networked and therefore their social activities have become even more intertwined. A modern learner relies heavily on environments where (s)he participate in various social activities, such environments present students with learning opportunities where they may acquire knowledge informally through participation.

Measuring amount of learning through social interactions may be difficult, however, further empirical research on social learning particularly applied to research processes may help in linking the interactions in social environments and the level of learning thereof.

### **6.7.3 Future research on social learning tools**

In earnest, some higher education institutes (HEI) have started to liberalise their institutions by making their structures more 'open', integrating new information and communications technologies into the design of their courses. For instance, Michigan Institute of Technology is one of the leading universities that have implemented most of their courses on open access platforms. Two related environments that need further research are 'Digital storytelling' and '3D immersive zone' environments (Bers, 2001; Salmon, Nie, & Edirisingha, 2010; Shapiro & Gonick, 2008; Vinogradova, 2007).

## **6.8 A final word**

The researcher can liken research as a journey to the unknown destination along different weather conditions and with multiple, obstacles. Because what lay along the way and what

awaits one at the destination is unknown, requires a well thought out plan on how the unknown territory can be traversed. The tragedy of not having a plan may mean countless cul de sacs circular traversals that lead nowhere. ...In short, many lessons are learnt along the road and these only but produce a hardened researcher.

University of Cape Town

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## **APPENDIX A: STUDENT PARTICIPANT RESEARCH PROFILES**

The following are brief descriptions of the research studies being carried out by the students who participated in this study. The names used are pseudonyms to protect the identity of the respondents.

- i. Paki, (Male doing Masters' by research from a university in Kwazulunatal)

"In my research, I am investigating how mobile learning applications can be used in large undergraduate classes to encourage active classroom participation." (Response: Paki)

- ii. Mic (Male doing Masters' by course work and mini dissertation at a university in the Western Cape)

"The reuse of digital teaching and learning materials by a social outreach student group." (Response: Mic)

- iii. Sib (Female doing Masters' by research – not active online at a university in the Western Cape)

"My research study concerns the practice of teaching and learning in a Zimbabwean rural context. The purpose of the study is to understand whether the practice do promote development and generate scientific abstract functioning in learners as expected of formal schooling." (Response: Sib)

- iv. Herm (Male doing PhD at a university in the Western Cape)

"Model to establish information & knowledge flow within virtual communities of practice." (Response: Herm)

- v. Sue (Female doing PhD – Not active online at a university in Pretoria, Gauteng)

"I am making a molecular and ecological assessment of the southern African dung beetles Scrabaeinae. This involves studying their food relocation behaviour and constructing a molecular phylogeny of the subfamily." (Response: Sue)

- vi. Eshi (Male doing Masters' by course work and mini dissertation at a university in the Western Cape)

"Okay my research interest is on exceptional people, focusing on the distinguished teachers at [university name]. Every year [university name], they award the distinguished teacher's award to four teachers who excel in their teaching and learning processes. So um apparently, there is no any resources or a model that can be applied so that other teachers can use to be distinguished. ... I'm trying to explore to see if ICT has anything or has a role in the distinguished teachers or their exceptional behaviours. Yeah." (Response: Eshi)

- vii. Tibo (Male doing Masters' by course work and mini dissertation at a university in the Western Cape)

“I am a science teacher, so my research interest actually is related to ...assessment of science learning. Eh that is yah, I am interested in finding out in particular, how teachers uuh help students through assessment in science teaching.” (Response: Tibo)

## **APPENDIX B: EVIDENCE (REFERENCED WITH AN EV PREFIX IN THE DOCUMENT)**

The following are extracts from the students' responses. The main headings are the low level groupings of the original themes on my initial data analysis.

### **Redoing the work**

Document 1 of 8

INTERVIEW\_QUESTIONS-1~2\_Filled - Sue

*Passage 1 of 2* Section 1.8, Para 28, 107 chars.

**(EV1/STD)** Yes, when a whole chapter of my proposed research fell off because of wrong assumptions that had been made.

Document 2 of 8      Paki22Aug2010

**(EV2/STD)** Yah I had a lot of problems that because you would compile like say 60 pages of your literature review and then you send it for reviewing when it comes back [some noise], your supervisor tells you uuh I can't see any logic, you haven't presented your ideas clearly, I can see the the ideas are there but then you haven't made them properly, so you haven't presented them clearly so you have to rework on the whole thing.

Document 4 of 8

Transcription - Eshi21Aug2010

**(EV3/STD)** ... See § 0

**(EV4/STD)** Delay! Delay! It took some time because yeah sometimes I had to go back and then overhaul the whole process or the whole dissertation

### **Challenges**

Document 1 of 8

INTERVIEW\_QUESTIONS-1~2\_Filled - Sue

**(EV5/STD)** See § 0.

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**(EV6/STD)** No no, it has been an uphill journey. Because it was really difficult for me to - to come up with my problem, identifying the problem, after identifying the problem, it was not easy for me to come up with the research question, so you know I struggled for quite some time to come up with like a sensible research question and the objectives and you know. *Preparing* and coming up with the the sensible research proposal. Yah.

**(EV7/STD)** See § 0

**(EV8/STD)** I think it's different because most of the things in research, you learn by yourself, you know, you go out there, get things by yourself. But then in class or (...) you get told, but then in research you have to go deep and find things for yourself

(EV9/STD) Just like I mentioned the the principal challenge of being critical you know, yeah because now I can take somebody's work and criticise it you know like yeah.

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(EV10/STD) Yeah, I can say yes, and some of those [learning challenges] basically I got from like my supervisor, because you know, I'll do things, only to find out that I did them in the wrong way,

Document 4 of 8      Transcription - Eshi21Aug2010

(EV11/STD) It's been tough a bit and I a bit of hiccups and but the thing is its all. I think its all the learning process because um yeah um so far I can say I'm happy with the way it is

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(EV12/STD) Yeah, tough being like sometimes you have this thing in your mind or you have like uh the way you're looking at the phenomena, but when you dig deeper and then try to see what their literature is, the literature regarding the phenomena under investigation, um sometimes like my area of phenomena to investigate, there is not that much literature. So what I am relying on is literature on the use of ICTs in higher education

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(EV13/STD) actually the problem being on the research questions because there is a lot when looking at a phenomena, there is a lot of stuff that comes in your mind, but not everything that you gonna [going to] tackle or you gonna answer everything. So the problem has been something like a bit I faced was like uh narrowing down and focusing on issues which was my area: use of ICTs by distinguished teachers. So at the beginning I was looking it like in a general thing which I think like uh it took me some time but I'm happy that as I was telling you the work with the supervisor and the research peer group have been helpful to give me a clear picture way forward.

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(EV14/STD) See § 0

Document 5 of 8      Transcription - Sue07July2010[1]

(EV15/STD) Okay my research involves uur looking at, I'm looking at molecular phylogeny and I am looking at four gene regions. One of the gene regions is particularly difficult to amplify, and its called CAD, so it has been very challenging but its very important because we think that its going to resolve our problems to give resolution to the, to the subfamily that I am looking at. So trying to amplify that particular gene region has been the most difficult part of my research.

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(EV16/STD) Yah, I mean but you have to consult others [on research design, structuring the research]

Document 6 of 8      Transcription - Taka22Aug2010-[Formatted]

(EV17/STD) I'll give you a simple example as to in most cases students try to come up with a research that will make use of both qualitative and quantitative research methods. But you find out that we've got several students now, they'll [*people who'll look at these proposals*] ask to remove some parts of their research, then they end up having only having a qualitative

(EV18/STD) Friends and college mates helped specifically on Information Systems theoretical frameworks. For a purely research course, the supervisor is never willing to lecture a student on such issues, thus

reading around without elaboration on why one chose a specific theoretical framework is always difficult.

## Challenges: Conflicts

Document 1 of 8      Transcription - Taka22Aug2010-[Formatted]

(EV19/STD)      On this issue it becomes complicated because what happens is you get help from the community, you get help from your supervisors to come up with a proposal, then you submit the proposal. For example in our university, at CPUT, you submit it to the department, then the department will make its recommendations now.

## Challenges: Barrier to Access

Document 1 of 8      Transcription - Eshi21Aug2010

(EV20/STD)      Uh definitely it's a good thing because uh most African countries have problems where students come from different backgrounds where they didn't have like access to knowledge or access to education, so scaffolding those students find themselves, right, in the community...I don't know how I can put this, its really helpful because given the background of students in African communities or African countries because they all come from different backgrounds where some of them didn't have privileges like others

Document 1 of 8      INTERVIEW\_QUESTIONS-1~2\_Filled - Sue

(EV21/STD)      When through observation we found out that something that had always been assumed to be a fact was actually not true. This clarified many issues and streamlined the direction of our research.

Document 2 of 8      Transcription - Sue07July2010[1]

(EV22/STD)      Yah, when you resolve, when you get a result from this challenge, it is exceptional. ... this is a difficult gene region for everybody, but its proven to be useful, so when you get a result, you know, its something to celebrate

## Consultations

Document 1 of 8      INTERVIEW\_QUESTIONS-1~2\_Filled - Sue

(EV23/STD)      for my area these [resources] include- access to current journals, adequate laboratory facilities, plus a community of other researchers that one can consult, discuss issues with etc

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(EV24/STD)      **Supervisors** are always available for informal or formal meetings. We can also communicate by email or by phone.

Document 3 of 8      Transcription - Eshi21Aug2010

(EV25/STD)      Um, I can't say um, the majority because we've been meeting in the same room, same meetings, people making presentations. But there is another issue of chatting. Because I always chat with my supervisor. So through the chat, I learn, or if I have any question and I see him online, I chat with him then ask a question and I'm really happy and the way he responds because whenever he's online he really helps me a lot and the questions that I ask. Regardless of his location because sometimes I don't know if he is in the country or he is overseas. Yeah.

## A Sense of Community

Document 1 of 8 INTERVIEW\_QUESTIONS-1~2\_Filled - Sue

(EV26/STD) I always have to be in close communication with my supervisors. I have to know their thoughts, the direction their research is going. It has also helped me to keep in touch with other members of my research group and our work is linked one way or another.

Document 4 of 8 Transcription - Taka22Aug2010-[Formatted]]

(EV27/STD) Basically we interact on Google, basically. We've got Google and Skype then in some fewer instances uh we meet personally ...

(EV28/STD) I think there must also, we must have a platform where people can comment those issues as well on that platform at that level so that people can discuss those issues

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(EV29/STD) In detail we discussed the conference papers, like the ones I co-published and the others my friends published, then the general structure of our thesis, where the different sections are critically analysed in terms of how important they are and how they link with the other parts to form the whole thesis.

<Transcription - Eshi21Aug2010> - § 3 references coded [8.53% Coverage]

(EV30/STD) See § 0.

Document 2 of 8 Transcription - Sue07July2010[1]

(EV31/STD) See § 0

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(EV32/STD) See 0.

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(EV33/STD) there are other *fora* or forums where people discuss: For example if you have a question, you can post it on these *fora* and people will respond to your questions

(EV34/STD) Its actually may be up to me to find other ways, for example the way I found out about this forum where people discuss, is that my co-supervisor sent me a response, I asked her a question and she sent me a response that she had been given by other people. And that's how I got to know that there are all these forums where you can post your questions..but I mean its not always that you can have a question that you cannot answer, and sometimes discussions like on the internet are not necessarily the best. Actually I find that I gain more from just overall discussions especially in the Scarab Group, because they touch on many things that you need to discuss in your own project.

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Passage 5 of 6 Section 1.63, Para 133, 71 chars.

(EV35/STD) Yah, it seems in the research community people a very helpful actually.

(EV36/STD) aum, its excellent actually because you're not alone, the whole research thing can really leave you isolated not knowing what you're doing, not knowing what step to take next. But being in a community of other research people of like-mind, you know people doing the same thing, some of them very passionate about what they are doing, it it helps you a lot because you can go to them and even for just tea or coffee but it will end up helping you in what you're doing. Because most likely on that person's table there will be a tray of dung-beetles and then they'll start talking about them, where they were found, why are they there, you know. So its very good compared to being by yourself and isolated.

## Community: Joint knowledge production

Document 1 of 8 INTERVIEW\_QUESTIONS-1~2\_Filled - Sue

(EV37/STD) My supervisor suggested that in my discussion (of a piece I was writing) I include biogeography. For me this was a totally new area and required extensive search for material on south African Forests, their formation etc. During a sorting session of the research group I talked about it and within a short time I was directed to the most relevant texts, articles etc and my work became much simpler

Document 2 of 8 Transcription - Sue07July2010[1]

(EV38/STD) Right, my, my co-supervisor has been working on other phylogeny in the subfamily that I have been working on so initially I was just using her protocols and [pause] all the methods that she uses like there are some, as I said some specimens or species that are particularly difficult, and for that we have to refer to other papers or other people's research, you know we are working on dung beetles but we look at other people who have looked at other insects, for example in the Neuroptera or other families to see what they have used and we try that as well.

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(EV39/STD) See § 0

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(EV40/STD) Yah! Because you don't have to start from scratch, you, if somebody else has already sorted it out, why should you start afresh? Or at least you you know where to begin

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(EV41/STD) Ok for example, uuuh one of the things that people do is in this molecular work, is to design *primers*, anyway these are , I suppose this is just jargon from our own field but in order to design primers you need to know the molecular data for a specific gene region and you can just get that molecular data from gene bank then from that information you can design your own primers, so in that way you you have your baseline data so to say from which you can do other things

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Document 3 of 8 Transcription - Taka22Aug2010-[Formatted]

(EV42/STD) See § 0

## Community: Learning from Peers & Others

Document 1 of 8 INTERVIEW\_QUESTIONS-1~2\_Filled - Sue

**(EV44/STD)** It has been useful also to work hand in hand with other members of the department with whom I share the lab. One can always learn something from others- it may be techniques, other ways of doing things, the problems they have had and how they have overcome them, etc.

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**(EV45/STD)** With lab users we have weekly meetings, or just as we work side by side in the lab. The research group meets periodically. Everyday there is tea or coffee for all postgrads and academic staff.

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Document 2 of 8      Paki22Aug2010

**(EV46/STD)** Basically I've been reading I've been reading, consulting with my supervisor, and even discussing with other people my ideas with other people

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**(EV47/STD)** Ok, so on that one, very luckily there was a course that was run, I think last semester, it was about critical writing. So apart from discussing the critical issues with my supervisor, there was one professor who was running that course so I attended it, so I think that helped me

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Document 3 of 8      Paki22Aug2010[Formatted]]

**(EV48/STD)** so most of the people, most of the guys they do research, and then they come back to say "this is the research that we did, and then we even presented this research to some company or to some other researchers"

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**(EV49/STD)** I think they were once in America something like that, and apart from there, they invite like people who are in the industry just to share with us how they do things out there, you know, yeah.

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**(EV50/STD)** I think, I am not sure whether it was a doctor or a professor, she was presenting about qualitative, I mean quantitative research, so she was mentioning all the (..) the issues that are involved when you're doing a quantitative research, so things like probability sampling, non-probability sampling, what that is, you know how you do the analysis and stuff, so we really learnt a lot and some other people who are also doing research, learnt a lot from that.

**(EV51/STD)** you can always ask a lot of questions, you can always make a lot of follow-ups and learn a lot from other people you know. Just like we consult the library books, the journals and stuff, and we get to learn a lot from, from those, so even if our relationship or our communication with those people who come to present were to (.....)

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**(EV52/STD)** Ah what I'm trying to say is even if our communication were to continue, that would help us to learn a lot from those people, yeah

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(EV53/STD) ..there is one Masters student, we are in the same office and we do share research ideas like what research design are you going to use and why? Why would one have to use an eye tracker for data collection? And a lot more issues (on informal grounds)

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Document 4 of 8      Transcription - Eshi21Aug2010

(EV54/STD) The peer group meeting we had. It was about the research, uh research journey or writing research or something like that so and then uh from there as I was telling you, it's a learning process going through how the other, the articles how they write their dissertation or how they write their papers, and then somehow I then like adapted or thought like I have to put everything in an introduction or these chapters you know. At the end of that session it helped me to really like um get something. Its like putting everything into its own location. Not like uh, I don't know how I can explain this but like putting everything to its right place.

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(EV55/STD) Definitely yeah because learning, in a community you learn through each other. I really appreciate and I would encourage other people to do so. Because communities of learning, when you meet with different people they tell their journey, then you learn from them

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(EV56/STD) And when other people like when they are presenting their journeys [research journeys] or talking about where they have been handicapped, right, you learn from them and then somewhere[somewhat] you get support from them or they give you some ideas how to go about where you're stuck. Yeah

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(EV57/STD) Actually um I would say the meetings when you listen [in audible-26:50] someone or you hear during meetings that rings a bell. On when it rings a bell, it intrigues you, your mind like uh you keep that. So I can say its been very helpful to me because during those meetings, most of them I always pick something, because there you think may be you mastered something or you know this, and somewhere during the course of these meetings, you pick something that intrigues your mind.

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Document 5 of 8      Transcription - Sue07July2010[1]

(EV58/STD) See 0.

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(EV59/STD) See § 0

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Document 6 of 8      Transcription - Taka22Aug2010-[Formatted]

(EV60/STD) A lot, I tend to learn a lot from these other colleagues.

## Learning & Transformation

Document 1 of 8      INTERVIEW\_QUESTIONS-1~2\_Filled - Sue

(EV61/STD) It has been a great learning experience with ups and downs. There have been a whole range of new things to learn, from work ethics, search techniques, laboratory techniques to computer software.

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(EV62/STD) Yes, I learnt how to deal with the type of problem I was having.

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Document 2 of 8      Paki22Aug2010

(EV63/STD) And I think what I've learnt from the comments that I've been receiving from my supervisor is at this stage

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(EV64/STD) .. and when the feedback comes back, she has comments on that just to say, "ah ah, this shouldn't be here, this should be here, you shouldn't include this because of this and that" you know so I learnt a lot from her, and that is how I've been learning to do research from her, yeah.

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(EV65/STD) See § 0

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(EV66/STD) But then before I could with this research then I wouldn't criticise somebody's work you know like the way I can do it now.

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(EV67/STD) Yeah I've really learnt a lot.

(EV68/STD) See § 0

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Document 5 of 8      Transcription - Taka22Aug2010-[Formatted]

(EV69/STD) right now I think things are starting to unfold, I tend to understand more. Uh if I'm to compare myself with when I started this research, uh may be its possibly because my background, I wasn't uh exposed to research so much, I was used to this um theory uh examinations type of studies

## New experiences

Document 1 of 8      Transcription - Eshi21Aug2010

(EV70/STD) Definitely yes, definitely yes because uh sometimes I was telling you regardless of the location of the person you're talking to especially with the current technology. If that person for example is overseas or he's not like in a physical location where you can't access him or her at that time, um the present technology really like I can say is very very helpful, and I don't know like if I rate it, I don't know like if you rate it in any grade, I'll give it like an 'A'

## Opinion on Sharing

Document 1 of 8      INTERVIEW\_QUESTIONS-1~2\_Filled - Sue

(EV71/STD) Of course one can never get enough of other people's thoughts and opinions, people will always have different points of view etc so research communities should encompass as many researchers as possible. So maybe conferencing by video etc

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Document 2 of 8      Paki22Aug2010

(EV72/STD) No, people have to share but then I am saying students are reluctant to share, they would rather share on social issues, than on academic issues, yeah, so there is that tendency, I don't know why but it happens that way.

Document 3 of 8      Transcription - Sue07July2010[1]

(EV73/STD) See part § 0 .. beginning with ...but *I mean its not* ...ending with ...*in your own project*.

## Participation or Continued Participation

Document 1 of 8      INTERVIEW\_QUESTION-1~2\_Filled - Sue

(EV74/STD) Do I get the information that I'm searching for?

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Document 2 of 8      Paki22Aug2010

(EV75/STD) Because it's just for your knowledge, so if you're interested you'll participate, if you're not interested, you'll not participate, but I think the only problem is people will only participate when they have problems, you know, just like yourself, just like myself since we're still in this research process, then we can participate because we know we can get something out of that, but then after we're done with our research then if you're not doing research anymore you'll, you'll not participate in that, you know because there'll be nothing to compel you to participate in that so I think that is one of the problems that I foresee

---

(E76V/STD) the thing is just like now I'm doing research, ok, so I have problems, I know that when I go there I can get some ideas on how to tackle some other issues, but when I'm done with my research, assuming my work no longer requires me to engage in research, then I wouldn't participate

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(EV77/STD) See § 0

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Document 3 of 8      Paki22Aug2010[Formatted]]

(EV78/STD) I don't foresee any problems there because the thing is if you want to share, you can share, whether you share or not its not like, you know what. Because it's just for your knowledge, so if you're interested you'll participate, if you're not interested, you'll not participate, but I think the only problem is people will only participate when they have problems, you know, just like yourself, just like myself since we're still in this research process, then we can participate because we know we can get something out of that, but then after we're done with our research then if you're not doing research anymore [in your working environment] you'll, you'll not participate in that, you know

because there'll be nothing to compel you to participate in that so I think that is one of the problems that I foresee

---

**(EV79/STD)** No the thing is just like now I'm doing research, ok, so I have problems, I know that when I go there I can get some ideas on how to tackle some other issues, but when I'm done with my research, assuming my work no longer requires me to engage in research, then I wouldn't participate

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**(EV80/STD)** It is always good to share the knowledge with other people, ok, but then, but then you know people, they just you know, they just want to do their job and that's it. But then if you're a passionate researcher, then even if after you've completed your research, then you can still go back and participate in that and help other students,

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Document 4 of 8      Transcription - Eshi21Aug2010

**(EV81/STD)** Yeah definitely because I'll be glad to have that because some of this stuff like VULA or other sites which like you have when you're still a student [22:30]. Once you've graduated those communities get terminated. So hopefully I'll have to have this repository and have access to it in the near future regardless of where I am so that I can *[not audible]*

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Document 5 of 8      Transcription - Sue07July2010[1]

**(EV82/STD)** See § 0

## Preferred Media

Document 1 of 8      Transcription - Sue07July2010[1]

**(EV83/STD)** I suppose if people could for international exposure really these kind of conference discussions, whatever video conferencing or something like that, at least is kind of live and you can *[inaudible]* ...you can respond directly and ask directly. Well I suppose I prefer direct talking and as I don't know, cause if somebody writes you may have a question and then you have to write again and wait for response, where as if its direct, then the person tells you and you ask if you have a query, and they were answered there and then.

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**(EV84/STD)** Yah, I suppose for me a chat thing would be good, because I prefer like, second to actual conversation, a chat I think is better for me. Because I can then quickly find out everything that I need rather than just posting and then waiting for days what ever for other people to answer. So yes, a chat place a chat, eech facility, references may be.

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Document 2 of 8      Transcription - Taka22Aug2010-[Formatted]

**(EV85/STD)** No the video is always the best, right, its more understandable in the video, it gives more emphasis but I had just taken into consideration the cost factor and the environment in which most

people are accessing uh these articles, right, like if you go to the library you wouldn't expect to find some headphones there

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**(EV86/STD)** Via text its better. There you can also easily print and refer to the stuff later. Because you see some of the stuff that you see on these links, today its there tomorrow you can't access it and we're saying for research purposes, sometimes its necessary for you to to take that and store it somewhere, and in most cases I find it more easier to refer to an article that is on hardcopy than on electronic, because then I can easily highlight and I can easily access the hardcopy than the soft copy, its more comfortable

## The KAR

Document 1 of 8 INTERVIEW\_QUESTIONS-1~2\_Filled - Sue

**(EV87/STD)** Because it's a community resource, it can be used in many ways by many different people in their research; and research furthers knowledge

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**(EV88/STD)** Giving you advice; direction

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Document 2 of 8 Transcription - Eshi21Aug2010

**(EV89/STD)** Yeah definitely because I'll be glad to have that because some of this stuff like VULA or other sites which like you have when you're still a student [22:30]. Once you've graduated those communities get terminated. So hopefully I'll have to have this repository and have access to it in the near future regardless of where I am so that I can *[not audible]*

Document 3 of 8 Transcription - Sue07July2010[1]

**(EV90/STD)** We do, we do. [No] but this is we just deposit information, like for example I am talking about this CAD these gene regions of mine, once I am done, I then post them into a gene bank, its called a gene bank where we bank our, you know, the molecular data that we get. So other people can access it, other people do not have to redo what has already been done, or they can compare with their own stuff that they are doing. But I mean that is just information like what is my blood type, you know that kind of ... its just genetic information, is not

**(EV91/STD)** I suppose if you can kind of uur ...put your problem in black and white people can always help you so long as you can put it in black and white, you know, the....*[not audible]* because now the online thing is in black and white is not really talking, but so long as you can tell people what your problem is I am sure people will respond. In fact I've seen that, huge, I mean people will respond in numbers really.

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**(EV92/STD)** uuh I don't know. I suppose it should cover basics for those who are starting and you know it should just cover all levels of information that people in a particular field may want.

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**(EV93/STD)** it should provide basic to more advanced stuff, it should provide for questions that people may have if possible like online, for example at the library, we have an online, I mean sometimes there are

librarians online and you can actually kind of chat. Yah, I suppose for me a chat thing would be good, because I prefer like, second to actual conversation, a chat I think is better for me. Because I can then quickly find out everything that I need rather than just posting and then waiting for days what ever for other people to answer. So yes, a chat place a chat, eehh facility, references may be.

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Document 4 of 8      Transcription - Taka22Aug2010-[Formatted]

**(EV94/STD)** Yeah I think since on that site we are saying there is no limit as to people, we have the supervisors logging on there and also the researchers, right, all logging on to there. I think there must also, we must have a platform where people can comment those issues as well on that platform at that level so that people can discuss those issues

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**(EV95/STD)** No the video is always the best, right, its more understandable in the video, it gives more emphasis but I had just taken into consideration the cost factor and the environment in which most people are accessing uh these articles, right, like if you go to the library you wouldn't expect to find some headphones there

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**(EV96/STD)** Definitely, if you get the relevant information in the right timing you always make informed decisions. Talking to many people will always bring new and useful ideas.

### Interview-Questionnaire – Sib

**(EV97/STD)** It is stressful when you have to meet your supervisor's deadlines and don't get the rightful resources that you know should get you over that.

**(EV98/STD)** At times you find you have a lot to do with regards to your research work and you are mixed up. You know you should do something but you don't know what. It

**(EV99/STD)** Enjoyable times are when everything in your research work seems to fit like bolt and nut. When you interview participants they give you answers you expected, and you need not make inferences of their responses but have them straight from the original data. When you review literature, you get exactly what you want as you want it. For it must be admitted that pre-conceptions in research always exist and needs acknowledging as researcher bias.

**(EV100/STD)** The story has changed because I realised the more I brought my own prior knowledge I blocked the in-coming of new knowledge into the field of research work. Again the more I brought my prior knowledge of research the more problems I encountered with my supervisor, its when I got to realised that prior knowledge had limitation because it is restrictive of new learning areas

**(EV101/STD)** I wouldn't say I am now an experienced researcher because they are a lot of new things that I am still learning up to now. That I have made a move, its true because I realise I have made a leap from my previous research practices, to a level I can confidently say it's two steps above the previous one.

**(EV102/STD)** My methodology chapter has been most difficult chapters of all my research chapters. It has been particularly difficult especially with regards to fitting in the Vygotskian research tradition in the qualitative research design.

**(EV103/STD)** The relationship between me and my supervisor is cordial, if that is the best term to describe it. We both abide by what we agreed on in our Memorandum of .....Every piece of work I submit I get feedback as early as possible. Never was a time when we were supposed to meet, and we did not.

Each one is committed to doing his part in the research journey. He is also sensitive to my social problems, this makes everything less difficult.

**(EV104/STD)** My brother helps me specifically with how I should go about the writing part of my research work. For example he assisted me with the best possible way to expose the research problem in my chapter one which all the time was not very explicit. He also helped me with how to include such things as picture to clarify ideas in my research work. My room-mate helps much with things to do with software which I am not very good at.

**(EV105/STD)** Time and costs in research are reduced as knowledge sharing can occur without stake-holders incurring transport costs from one area to the other as information can be shared on line. Again this type of mediation enables vast amounts of knowledge to [b]e shared by research communities as a number of stake holders can be involved. For example student to student interaction, student to lecture to other student interaction and other stakeholders can be facilitated through this kind of mediation.

**(EV106/STD)** They are quite convenient and reliable. For example when a piece of information is on-line definitely one will access it, it's unlike a book in the library that you may not get it because somebody has got it first

## Knowledge Advancement

Document 1 of 8 INTERVIEW\_QUESTIONS-1~2\_Filled - Sue

**(EV107/STD)** The community was not really involved in this particular case but this is knowledge I can pass on should someone else experience the same problem.

## Relationship with Supervisor

Document 1 of 8 Paki22Aug2010[Formatted]]

**(EV108/STD)** It was just between me and my supervisor {ok} and I think- I think she was consulting though, though she didn't tell me {umm} who she consulted but then she said she consulted one professor, so in other words after after working on the research proposal and the research question, the objectives and stuff, she gave it to some professor, s

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Document 2 of 8 Transcription - Eshi21Aug2010

**(EV109/STD)** See 0

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Document 3 of 8 Transcription - Sue07July2010[1]

**(EV110/STD)** See part of 0

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**(EV111/STD)** See § 0

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(EV112/STD) Uh, so far I think there are some few challenges that I've met, uh the first and foremost is the relationships that we have with our supervisors. That uh in most cases our supervisors are busy people, right, you can actually see that the people are busy, they're always busy, so they don't like push the students as it were,

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(EV113/STD) if the supervisor now, with his experience from the previous students, knows that the students if they're not pushed, they'll not work, now I believe if they change that attitude and at least give attention to pushing students, it'll help a lot.

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(EV114/STD) Yeah, I think it goes again back to the supervisor that usually students are writing according to the style of the supervisor, uh of which if the supervisor was a bad writer, then the student will follow that, so you find out that as we have different supervisors, we tend to meet some different styles.

(EV115/STD) I think I gave up to early on that because initially I, you know if you don't have the vision of what is going to happen tomorrow, how its going to affect you tomorrow, then if you don't appreciate the gravity of that change, then you tend to accept it but now the problem is with the supervisors, because at least they are the ones who have a better understanding of how it'll affect the final outcome of the research.

(EV116/STD) See §0

## Reluctance to Share

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(EV117/STD) Yes, it would be yeah, quite appropriate to have that research community. But then I think what I've learnt is people do not want to like to share the problems that they experience. Because now when you look at Facebook, people are just free to (..link lost..) ..to educational, you know like academic issues, I don't know the the perception that students or people have, because they don't want to share the problems that they experience.

(EV118/STD) Mmm, because I think in one of the meetings one lecturer asked us "Why is it that you're reluctant to share academic issues on Facebook?" But the reason was because Facebook was developed with the the social aim you know, with the social aim but not with the academic aim. But then that does not stop us from sharing academic issues, but it doesn't happen.

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(EV119/STD) It is always good to share the knowledge with other people, ok, but then, but then you know people, they just you know, they just want to do their job and that's it.

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(EV120/STD) See § 0.

## Research Environment

Document 1 of 8      INTERVIEW\_QUESTIONS-1~2\_Filled - Sue



**(EV121/STD)** To conduct research satisfactorily all the resources you require should be available; for my area these [resources] include- access to current journals, adequate laboratory facilities, plus a community of other researchers that one can consult, discuss issues with etc

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**(EV122/STD)** Ok, I think its uu, you need to do research in an environment where by you're near to the place where by you're going to collect data, just like now in my case, I am going to collect data from a group or from a class, you no, registered for a second module so for me to do that research I have to be like at school you know, on campus to be close to the people that I am going to collect data from, yeah.

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**(EV123/STD)** Yes, it would be yeah, quite appropriate to have that research community.

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**(EV124/STD)** I think if there there is that um. If may be we are to share on the web, like we're to share ideas on the web, just like I've been referring to Facebook, if there was something, there was um something like Facebook where we share only on academic issues, I think that would do.

Document 4 of 8      Transcription - Sue07July2010[1]

**(EV125/STD)** Like where I am its alright because I have got access to... I've got access to, you know I've got internet access, email access.

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**(EV126/STD)** I suppose yah, I suppose if people could for international exposure really these kind of conference discussions, whatever video conferencing or something like that, at least is kind of live and you can [inaudible] ...you can respond directly and ask directly.

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Document 5 of 8      Transcription - Taka22Aug2010-[Edit]

**(EV127/STD)** I believe the college environment is always the best, because if I look at my own area, uum we've got some websites where we get the articles. We've got some electronic textbooks that you can only access from the college premises, you can not access them from any other place, and those are important, very much important.

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**(EV128/STD)** I rely on material from the from the internet, basically the electronic textbooks, there may electronic journals from the websites, the databases, electronic databases

**(EV129/STD)** Yeah, basically we are researching and we just treat each other as colleagues even though some of them are now at doctoral level, I think we share the same articles, we share the same textbooks, we share the same databases so we tend to share everything. So I believe the same help I'm getting from them they're also getting that help from me as we interact.

## Research Process

Document 1 of 8      INTERVIEW\_QUESTIONS-1~2\_Filled - Sue

**(EV130/STD)** Through observation of the behaviour of target organisms in the laboratory as well as looking at part of their [dung beetles] genetic make-up

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**(EV131/STD)** See § 0

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**(EV132/STD)** And this is a self directed learning process

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Document 3 of 8      Transcription - Eshi21Aug2010

**(EV133/STD)** The ideal environment is to be aware of the processes, you know, to know what's going on, because sometimes when you're learning how to do this thing you learn it in a general way, but when you go to the ground, right, the field is something different so you have to adapt and demonstrate to put anything in the context of your research.

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Document 4 of 8      Transcription - Sue07July2010[1]

**(EV134/STD)** Okay, with my project there is no concern about ethics, at least it seems these insects, no body worries about them so we don't have to go through any ethics committees and all that. Uum, about the validity of my results, I don't know, we..to validate my results, I, for every species that I am working on I use a minimum of three where ever possible, so that you know, to confirm my results. I use three specimens of the same species

**(EV135/STD)** In the department, well in the department, ok in our department you write a proposal and you have to present it to the whole department and then people would make their suggestions, they will correct you, they will give their input so that when you start your project you know you've got views you know from other people from outside your own particular supervisor because no one knows everything or no one can think of everything. So other people can help you by giving their input or their insights

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**(EV136/STD)** Ok for example in my particular research its kind of classification to put it simply, of this particular group of dung-beetles which has been using morphology that is using physical features, which is one way of looking at it, and I am looking at the molecular aspect, so I am using molecular techniques you know to ...try and see whether I am going to come up with the same theory or the same, the same phylogeny [pause] I don't know so I am just looking at a different method of arriving at how we classified those organisms and then I'll compare the molecular and the morphological ..[inaudible]

## Community like: Sharing knowledge in a social environment

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**(EV137/STD)** If may be we are to share on the web, like we're to share ideas on the web, just like I've been referring to Facebook, if there was something, there was um something like Facebook where we share only on academic issues, I think that would be ok {ok} Mmm, because I think in one of the meetings one lecturer asked us "Why is it that you're reluctant to share academic issues on Facebook?" But the reason was because Facebook was developed with the the social aim you know, with the social aim but not with the academic aim. But then that does not stop us from sharing academic issues, but it doesn't happen.

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**(EV138/STD)** They can, they can share knowledge in a social environment, because now between me and you, we can share academic issues, but then the tendency now is people share only social issues

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Document 3 of 8      Transcription - Sue07July2010[1]

**(EV139/STD)** Ok, on a local level, for example, I am in the Scarab Research Group. Sometimes we meet, not necessarily to discuss uuh molecular problems but I mean in the scarab research, other people are doing other things, but we get to discuss about generally what people are doing and you get a lot of insight about a lot of things, not necessary the molecular things, but I mean, when I discuss, when in my discussions, it won't be necessarily be molecular, I will have to touch other aspects of the subfamily, so just when we meet as a scarab group, we talk about a lot of things, and you get a lot of information that way, also we have a Journal Club for the molecular lab, with people who work in the molecular Lab. These people, these are people who work from different research groups. We, we discuss issues, we discuss problems, we discuss journal articles. That is on a local level.

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**(EV140/STD)** But with the Scarab meetings, these are just meetings we have maybe we are sorting insects and we just start discussing, and people discuss what is happening in their projects. So well, I suppose there you have to remember what is relevant to you or what is important to you, because its ...informal.

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**(EV141/STD)** Yah generally the scarab meetings we normally discuss when we are sorting insects may be after a field trip then people start discussing their issues, well, their projects.

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Document 4 of 8      Transcription - Taka22Aug2010-[Editt

**(EV142/STD)** Ok uh now that I've got enough connections, like I've got people within my areas of study, people who're - are close, who I can access anytime, life becomes much more easier now, so basically rely on friends and other research colleagues, instead of uh getting that help from my supervisor.

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**(EV143/STD)** Basically we interact on Google, basically. We've got Google and Skype then in some fewer instances uh we meet personally ...

## Community like: Sharing of ideas and knowledge

Document 1 of 8 INTERVIEW\_QUESTIONS-1~2\_Filled - Sue

**(EV144/STD)** I then asked a more experienced lab colleague if he had ever encountered the same problem. He suggested I make changes in the temperature that I was using which I did and my problem was solved.

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**(EV145/STD)** she would share the articles with me, and I do the same thing because when I find some thing that I think this one is useful, then I share it with her.

**(EV1460/STD)** Yes, I think that one is very helpful because normally in our department here, what happens is every Friday there is what we call yeah is what we call Friday talk

**(EV147/STD)** See § 0

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**(EV148/STD)** See § 0

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Document 4 of 8 Transcription - Eshi21Aug2010

**(EV149/STD)** Definitely because to me I see it as like a two way traffic. Because if I'm learning from you definitely you're learning from me. So it's like if you're presenting today and I learn from you and if I present tomorrow you learn something from me. So I think, to me it's a two way traffic.

## Solving Problems

Document 2 of 8 Transcription - Sue07July2010[1]

**(EV150/STD)** Because most likely on that person's table there will be a tray of dung-beetles and then they'll start talking about them, where they were found, why are they there, you know. So its very good compared to being by yourself and isolated.

## Support from others

Document 1 of 8 INTERVIEW\_QUESTIONS-1~2\_Filled - Sue

**(EV151/STD)** See § 0

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**(EV152/STD)** It's the most important in understanding the research process. Without the advice and direction of supervisors for example, research would be much more difficult

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(EV153/STD) Yah I want to say she [supervisor] is very supportive, she's very supportive,

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Document 3 of 8      Transcription - Eshi21Aug2010

(EV154/STD) Yes, definitely, it's a challenge and it's been a challenge and I'm happy that talking with different people, my supervisor and the peer group meetings has been a lot of helpful.

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(EV155/STD) See § 0.

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(EV156/STD) Yeah definitely, my supervisor and other people [ narrowing down (research question) you were greatly assisted by other people]

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(EV157/STD) Definitely other people have been of help. I can give you an example, like a very recent example. the last group meeting that we had. The last group meeting we had was a very very helpful one.

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(EV158/STD) For example there is a lot of stuff that I've put like in the introduction chapter which after that meeting, my dissertation or my first draft met a very like a major overhaul and panel beating

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Document 4 of 8      Transcription - Sue07July2010[1]

(EV159/STD) Well in the Scarab Group, yes, since we are all here at the University of Pretoria, you can then go to the person and seek further details or they may refer you to an article or a book or a journal. So yah, at least at the local level you are able to get more information from the person.

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(EV160/STD) See § 0

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Document 5 of 8      Transcription - Taka22Aug2010-[Edit

(EV161/STD) Ok uh now that I've got enough connections, like I've got people within my areas of study, people who're - are close, who I can access anytime, life becomes much more easier now, so basically rely on friends and other research colleagues, instead of uh getting that help from my supervisor.

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(EV162/STD) I think we tend to get a lot of help from these other colleagues, yeah in terms of uh our research styles. And uh the way we write our research writing, we tend to get a lot of help from these other colleagues because they are always available, most of them they are always listening so especially those who're ahead they would have met similar problems, so when you ask them, you tend to get the necessary help

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(EV163/STD) See §0

**(EV164/STD)** Like I said before, our supervisors are always busy, and these friends are always available for even some small issues that could delay one's progress.

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**(EV165/STD)** The help that I get from my community ranges from study material, i.e., articles, textbooks, websites, internet access, and conference articles, for example whenever one of us presents a paper, then we all get the whole collection of the conference proceedings. Sometimes we also get explanations and elaborations on certain issues, as we understand concepts differently.

## Technology Barrier/Enabler

Document 1 of 8      Transcription - Taka22Aug2010-[Edit]

**(EV166/STD)** I think typing is more comfortable, if you look at uh the way we access internet at this level, most people access the internet without headphones, right, and some people are accessing the internet at home and bandwidth is still expensive, downloading a video, given a video and text format, html, I would prefer the text.

## Time Barrier/Enabler

Document 1 of 8      Transcription - Eshi21Aug2010

**(EV167/STD)** See part of § 0

## Virtual community environment

Document 2 of 8      Transcription - Sue07July2010[1]

**(EV168/STD)** I suppose yah, I suppose if people could for international exposure really these kind of conference discussions, whatever video conferencing or something like that, at least is kind of live and you can [inaudible] ...you can respond directly and ask directly.

## Interview-Questionnaire – Sue

**(EV169/STD)** There are always ups and downs. When you overcome obstacles the feeling is great, but when things are not working out, then it is very stressful because you must sort the problems out and time is not always on your side.

**(EV170/STD)** I brought in the basics from my BSc and MSc experience.

**(EV171/STD)** Yes I have definitely become more experienced. I have gained much in terms of how to get information (see Question 3) as well as what kind of questions a researcher asks as the research proceeds. Also, one must not merely collect just record the data planned according to the project proposal, but make any other observations during experiments because most likely they will be of us[e] sooner or later.

**(EV172/STD)** I've had to read and understand material in fields that I would not normally associate with entomology but which help with explanations of certain aspects that I've had to discuss.

**(EV173/STD)** My co-supervisor and others in my research group directed me to relevant books and journal articles. Discussions with them also helped.

- (EV174/STD) My relationship with my supervisor has had its ups and downs, but has generally been smooth. One thing I have learnt is that it is important to meet or communicate on a regular basis so that the supervisor is aware of progress or problems being experienced. Otherwise as a student you may take a totally wrong direction or waste time trying to solve a problem that the supervisor may sort out immediately. I also have a co-supervisor with whom I've had a smooth relationship.
- (EV175/STD) 'relationship ...has had its ups and downs, but has generally been smooth'
- (EV176/STD) I have support from other members of my research group working on the same group of organisms as well as members of the molecular lab.
- (EV177/STD) If for example I have certain results which I cannot explain, a more experienced lab user may be able to help. Sometimes during general discussions on our study animals people may mention facts that will help you understand your observations better.
- (EV178/STD) It is a great learning experience because you have help all around you.
- (EV179/STD) Face to face, telephone and e-mail.
- (EV180/STD) Text books from the library, journal articles from the library or the internet, writing to specialists directly with particular queries.
- (EV181/STD) Experienced researchers are not always be available or accessible to the newcomers. They may generally be busy or away doing field work etc.
- (EV182/STD) I think these are great because they open the field even wider as people from all around the world can share their own particular experiences.
- (EV183/STD) One can get information immediately from a wider variety of sources. So if one has a lab query, for example, chances are someone will have the solution since there is access to more people than in single lab. One can then apply the suggestions and see the outcome faster than writing to people and waiting for solutions.

### Interview-Questionnaire – Herm

- (EV184/STD) Sometimes stressful, other times good times; depends on the effort you make and the outcome you get out of your efforts. Usually it is the procrastination from the researcher's side, the late responses for questionnaires and other factors that contribute to the stress.
- (EV185/STD) There is a new element as you progress; but budgeting affects the learning experience.
- (EV186/STD) I have somewhere moved from novice to the middle-of-the-road; it is still in the continuum towards being experienced one. But, definitely I have learned a lot such as how to prepare a questionnaire in which I was very new to do that; how to get a consent from participants of the research.
- (EV187/STD) Data collection; finding the real problem of the research; late response from the participants.
- (EV188/STD) Yes, one of my colleagues (former student) assisted me in putting the questionnaire web-based. Another friend gave me insight on the methodology of the research.
- (EV189/STD) Face to face; e-mail; discussion forums; telephone; workshop; conferences
- (EV190/STD) Books, e-journals, journals, Internet

**(EV191/STD)** differences in culture (a culture of sharing); not having common knowledge or experience; not having common practice; budgeting – lack of monetary or intrinsic incentive

**(EV192/STD)** Ambiguous question? But if I understand it correctly – there are many research communities online now and they are booming. It might not replace the face to face research communities but it will be a good supplementary platform to share knowledge across time and boundary...check km4dev.org with about 1700 members sharing their experiences which include research experiences shared online.

**(EV193/STD)** It will imply that people will be increasingly online to learn rather than waiting for face to face...will be more independent to learn...learning will not be confined within a narrow boundary...that is people will have more international experience across boundaries...quicker diffusion of knowledge from one area to another.

### Interview-Questionnaire – Paki

**(EV194/STD)** It is all hard work from start to finish. But at times when supervisors need more than I had thought it's my best, it gets stressing, but once I start working on that, things do get in line.

**(EV195/STD)** I have really learnt a lot during this research journey. I learnt from extant documentation, colleagues, supervisors, etc.

**(EV196/STD)** Yes I have. Because, by the way, I had to use all the skills that I had already acquired before I started with this research.

**(EV197/STD)** Yes. I was not that critical before I started with this research. Academic writing is not a problem anymore.

**(EV198/STD)** **Data collection problem.**

**(EV199/STD)** I put my online questionnaire early November, but since students (main data sources for my research) were already towards their final examinations, it was not easy to get enough data such that I ended up printing the questionnaire and requesting them to fill the paper based one.

**(EV200/STD)** It was people who advised on the data analysis methods suitable for my study.

**(EV201/STD)** With peers, you can ask anything, even questions that you would regard stupid and you would not ask your supervisor, so learning so smooth. With experienced researchers, they provide several options for one to choose from, it is not like they will say, this is the way to go. So this means the researcher has to go an extra mile to weigh the available options and this creates a better and self-learning experience.

**(EV202/STD)** Email, Face to face discussions, Telephone,

**(EV203/STD)** Library texts, Internet, Online and print journals, Magazines, Other texts

**(EV204/STD)** Experienced researchers do not just volunteer to share, instead there has to be some trigger, for example, a new researcher asking or struggling with something and bringing it to the fore, then they can share the knowledge.

**(EV205/STD)** Think such facilities are important and necessary because they help researchers share their knowledge and perhaps to hear what other people are struggling with. For example, if one has been struggling with something and at a later stage, after being sorted out, you find that someone else is struggling with the same thing, you just share how you went about solving the problem.

**(EV206/STD)** Broader sharing of ideas at anytime



## Nicola

**(EV207/STD)** I had challenges right from the start, yeah with the whole process and how different it was to my honours year and the writing-up. It's still writing but the paradigm shift in terms of understanding the format with which you're writing in now. Because in my honours year I had to first learn how to do the format of the UCT essay.

**(EV208/STD)** No, no. and I believe that every university has its own format of doing things and you got to get into the community, as you said earlier about Wenger and learn the norms of the community and then you can also, I felt like I could break that down as well, down to every supervisor you had. I think every supervisor has a different set of norms of how they do it. And like you know negotiating that space between what you expect to know and want to do and how your professor or your supervisor he wants or she wants to do things or sees the result or challenge.

**(EV209/STD)** For me the biggest challenge was also time, I had in my mind set out a time frame on when to achieve x, y, z and when I didn't achieve that then we're shifting those goal posts {yeah I know}

**(EV210/STD)** Uhm it was a problem for me because I did the course that a new student has to do, the Research methodology and also that I was quite indistinct as to what I was going to do but then my supervisor came forth with ideas and funding and then I went on that path. So it was a collaborative experience coming up with the question as well as the methodology

Nicola:

**(EV211/STD)** Oh well it was an organic process because as I said I was offered funding and the questions materialised from there but then organic things happened like the ethnographic style came in because I was gonna compare two schools and then because of the volunteer, via volunteer work and because I was doing it I saw how it spoke to what I was researching.

**(EV212/STD)** Yeah! I would say my whole process is being very organic and all over the place but eventually things started funnelling into a path but in the beginning it was, it felt like indistinct cloud but now am seeing more tangible results. Doing a poster was kind of a condensation of all the work even though its not finished but it also helps as a pointer and a guide because I'm sure I could almost use this whole poster, put it up on the wall and as I'm writing up I'll be like "wait wait I'm going off topic remember x,y, and z"

**(EV213/STD)** Um am re-analysing at this stage in my writing up because I'm in a process with my supervisor sending things back and forth, editing sending it back, re-editing and one other things my supervisor said was I needed to more closely analyse. So that's where I am right now and also finalising chapters. Um yeah the most difficult part in the whole process for me um I think believing I knew the conclusions already when I started. Yeah.

**(EV214/STD)** You know and I wasn't quite sure if you're not supposed to work that way. I don't know if you're supposed to work towards your conclusions? I don't know if you should know your conclusions before you start. But then there is also serendipity. You know along the way you discover 'oh wait this is a conclusion I never foresaw' which is welcoming coming Usually they say there is researcher bias

Nicola:

**(EV215/STD)** Yeah, because I think as any researcher at UCT or anywhere, if you see that the data isn't, um you not happy about it or um if its not coming to the conclusion so um but I must say I haven't, I don't, I had my conclusions and through my analysis nothing has come up that's totally different and unexpected except for finding differences and similarity, but it's the difference that counts, the social practices that are different. Yeah.

**(EV216/STD)** I do regret that I had very little interaction with fellow students. I had little mediation with other students, well fellow students; it was a very solitary experience.

**(EV217/STD)** Because I feel they would have been a lot of um a lot of helpful, um it would have been a helpful process to have interaction with fellow students, especially when it came to breaking down the thesis as a whole into manageable units, yeah.

### Interview-Questionnaire – Mic

**(EV218/STD)** Its hard work but it's rewarding. Meeting many interesting scholars, academics, and researchers.

**(EV219/STD)** Learning constantly as I go. Constantly reforming my understanding of research and the research process. Supervisory role is key in learning.

**(EV220/STD)** My IT knowledge has allowed me to work with lots of data as well as navigate the internet for good sources of material. My social media knowledge allows me to share my work and connect with others, most notably global experts in my area of interest.

**(EV221/STD)** I would like to think so. I can now see opportunities for research in the work I do on a daily basis. For instance, things I normally would have just done and completed, I now reflect on ways in which I might generate research questions from the phenomenon I have experienced.

**(EV222/STD)** Developing a voice and standing firm on my research findings. Essentially, confidence.

**(EV223/STD)** Working with my supervisor, sharing my work in the open, getting feedback.

**(EV224/STD)** Great relationship with lots of contact. Supportive, challenging and rewarding!

**(EV225/STD)** Friends in our research peer support group, colleagues in the office.

**(EV226/STD)** Talking about research and sharing processes and relevant research or books.

**(EV227/STD)** We are able to share our experiences and challenges and learn from one another. Also more senior researchers are able to mentor and coach new researchers.

**(EV228/STD)** Discussions, email, Vula

**(EV229/STD)** Books, papers, research, blogs, websites, forums, chat sessions, newspapers

**(EV230/STD)** Older researchers could embrace social media (i.e. blogs, twitter) to share their research more deliberately. That way a student could follow the 'process' of research rather than just having access to the 'product' of research.

**(EV231/STD)** These are only useful if people have the time to spend contributing to them. There must be a motive behind their use. They must be 'open' in the sense that Twitter or blogs are open.

**(EV232/STD)** It is very difficult to learn research processes from online facilities alone. I don't believe I would be where I am now without direct access to my supervisor and other researchers. Talking through the process of research with my supervisor has been essential to my progress.

### Notes – From My Memos

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**(EV233/STD)** VLEs also allow the student to control the learning process in a way that they can individualize their learning experience through utilizing different tools such as email, bulletin boards, or threaded discussion aiming for different learning styles. It is through these control activities such as self-

evaluation, self-assessment and reflective understanding implemented by students during their learning process that a constructive process takes place (Huffaker, 2003). As Jonassen, Peck and Wilson (1999) assert technology provides a ground for “storing, organizing and reformulating the ideas that are contributed by each community member” and acts a medium for participation in simulated experiences, apprenticeships and cognitive partnerships.

**(EV234/STD)** ...view of learning as a ‘fundamentally social phenomenon’ (Wenger, 2004, p. 3) , this may facilitate the potential of working in collaborative groups through the exploitation of the affordances that ICTs offer in supporting learning within the university and in cooperation with the community

**(EV235/STD)** ...in the CoP context, since participants must in principle share tacit knowledge, collectively build up knowledge, and solve production or service problems. In this context, the social relations between actors cannot be neglected. Therefore, one of the main conditions mentioned in the literature concerns the commitment of participants to the task or the community, as well as the interest and motivation of individuals to work together as a group. Some authors refer to a “joint enterprise” to describe the mission or common objective that participants give to a CoP.

**(EV236/STD)** Through conversational language used in a social context the emerging patterns are negotiated into meaning and the construct of the “zone of proximal development” is bridged via deeper learning (Vygotsky, 1990). So, learning occurs through joint problem-solving between partners and social interaction (Vygotsky, 1990).

**(EV237/STD)** Language as Key to People’s Subjective World

**(EV238/STD)** In the view of most qualitative workers, natural language more closely represent the psychological reality of human experience than the formal abstract categories that psychology usually uses (Polkinghorne, 1990). Qualitative investigators thus give priority to ordinary conversation and ordinary everyday language. They gather data via focus groups, open-ended interviews, field observations, and other situations in which talk is unconstrained by research protocol. They approach transcripts, tapes, and texts from multiple angles of vision, searching for patterns of meaning.

**(EV239/STD)** The constant change and instability of modernity generate a sense of anxiety. Drawing on Goffman, the ethno methodologists, Erikson, and Heidegger, Giddens argues that people must develop trust if social relations are to exist across time and space. Trust is tied to a sense of ontological security, which is a belief in the continuity of self-identity and the reliability of social life.

## Sample Transcript

**TBO: 15 Aug 2010(UCT Post Grad Hum Lab)**

**Notation:** An ellipse .... Denote a pause, number of dots indicate relative length.

Interruption and continuation are indicated by =

CAPS indicate stressing or emphasis of point (Voice raised)

**(EV240/STD) SM:** The interview will be recorded and whatever you say is um not going to be repeated elsewhere, and I’ll only use the data that I collect, I won’t mention names. So are you okay with that?

**(EV241/STD) TBO:** Ok its fine

**(EV242/STD) SM:** before we get there, briefly to you, do you mind stating your research interest?

- (EV243/STD) **TBO:** Ok, umm, I am a science teacher, so my research interest actually is related to ..assessment of science learning. Eh that is yah, I am interested in finding out in particular, how teachers uuh help students through assessment in science teaching.
- (EV244/STD) **SM:** So far you are conducting a research in assessment
- (EV245/STD) **TBO:** Yes that is actually is the area I am doing my research on
- (EV246/STD) **SM:** Do you mind describing the process of how you have been doing your research?
- (EV247/STD) **TBO:** Ok. By, by process do you mean from the beginning to the end?
- (EV248/STD) **SM:** Yes, like from the beginning to where you are may be?
- (EV249/STD) **TBO:** Ok, actually my research process includes firstly: to decide the questions I want to answer and also to do an extensive literature review on the area I want to research. And as I was reading, I was trying to see where the researchers in that area have not explored enough in for example in teaching of science, but specifically that in the context of Lesotho. So my, that's where my research question actually developed, so I developed my research questions and objectives from after reviewing a literature. Yah. Then from there I wrote a proposal which was later on accepted after several drafts of cause.  
And then I developed data collection tools. So because I am interested in large study which can be, which can give me a broad picture in real problems in science education or how they [SM clear throat, inaudible] in Lesotho, I try as much as I can to explore many teachers so I used quantitative research uh survey, specifically a survey method, where by I sent questionnaire to participants and they fill-up the questionnaire on their spare time and later on I collected the questionnaire.
- (EV250/STD) **SM:** Now um would you say everything has been smooth sailing?
- (EV251/STD) **TBO:** No, every, along the way it has not been that easy. At the beginning, just from formulating an acceptable question from my supervisor's point of view, I had to do several drafts, in the same way to develop an acceptable proposal in my department of science education it took some time to say this is the one I can accept according to my supervisor. So that was itself a very challenging part. Then from there to develop a tool for collecting data, it was even more challenging, it was not easy to locate the instrument that is the questionnaire that is already developed. So I had to adapt someone's questionnaire and to modify it to suit my purpose of research. And in developing that itself was a very challenging part of it yah.
- (EV252/STD) **SM:** Now uh, these are some of the challenges that you met. How were you like able to resolve some of these? Like you talk about uh first of all if we look at formulating the research question?
- (EV253/STD) **TBO:** Yah! Actually I ..... yah I did discuss some of them with my colleagues who were doing a research method course, so we discussed with them also, of cause also alongside my supervisor was helpful in that regard also. And another thing that helped me a lot is to try to identify people who have the same interest in that area. People who [not clear, noise] discuss what you're trying to do. And they provided helpful information regarding on how and what I can say and so on.
- (EV254/STD) **SM:** So in all the different um um problems like the first one was to formulate, and also on the proposal part, then also on data collection. In each of these, you were being helped by people
- (EV255/STD) **TBO:** Yes yes, people were there without those people like colleagues and those who have done research before me in that area I don't think I would have been able to do this. But the most challenging part of it from my side was data collection. Yah, it was very challenging because a questionnaire where by people fill it themselves, they do agree, it was easy for them to agree to that

they will fill the questionnaire but only to find that when I had to collect it, they have not filled the questionnaire so they kept on postponing the date for collection.

(EV256/STD) **SM:** So how did you solve that?

(EV257/STD) **TBO:** Basically I had to make a lot of follow up to the participants, I keep on reminding them, hey I will be collecting, remember the date and even when I was on my way to collect the questionnaire I would say now I am leaving I am coming right to you to collect the questionnaire. I think that is what motivated many people to fill up the questionnaire.

(EV258/STD) **SM:** How did that affect your research, like to delays and all that?

(EV259/STD) **TBO:** Yah, actually is delays because some of them they postponed the final date for collecting the questionnaire, they postponed, but because I also wanted some data from them, I agreed with them about the possible future date, and in the same way, most of them keep on postponing and I keep on reminding and keep on postponing when I went there to collect, but along the way I was being able to collect some who had postponed. Yah so at the end I managed to collect a reasonable of completed questionnaires, which was, I think it was 70 something percent response rate.

(EV260/STD) **SM:** Now, after having gone through that, what would you say would be a conducive environment for someone to conduct research? .....

(EV261/STD) **TBO:** The best environment: I think the very important thing is to research on an area where you have great interest that is very important, because that is where – because what I have realised is in research you – you invest a lot of energy, a lot of time, and of course a lot of money and if you're not motivated you may – you may stop everything just in the middle of it if you're not interested – but if you're interested, it kind of you are always motivated and get interested to each and every stage you get into, you want to do the next level to see what will come and so on so that is, so interest is very important. And because of the time that is involved in research and all other – all those other factors, I think it's very important to do a research which you think it will be, it is potentially applicable in real life situation, it will solve existing problems in that area you are – you are researching so that in the end when you come up with conclusions you'll say you have come, you've been able to solve something in that area or to come up with a new knowledge may be you can say that. Yah.

(EV262/STD) **SM:** Ok, you – you said you were uh using questionnaires and you were dealing with people?

(EV263/STD) **TBO:** Yah

(EV264/STD) **SM:** One of um the problem in research is ethics. How were you able to solve that one? Did you have any problems with ethical issues?

(EV265/STD) **TBO:** Yes, ethics I went through all the necessary ethical issues before research. I wrote the letters which request to – to give me access to schools to the ministry of education of Lesotho responsible office and they accepted that. I wrote personal letters to schools which I have identified to take my research in them. I also wrote, on each questionnaire I also attached a letter which state all the purposes of the questionnaires and I also assured the participants that the questionnaire is anonymous their identities will be totally secured yah from I will do my best to do that so it was cleared.

(EV266/STD) **SM:** You didn't have any problems from that?

(EV267/STD) **TBO:** So in that case I didn't have any problems along the way as I did.

**(EV268/STD) SM:** Ok, then after collecting data you said um one of the best things when someone is conducting research is the potential for applicability, for it to be applied elsewhere. Now looking at your research um one of the things that comes to mind is the integrity of a research. Like how valid your research is. Now how have you been able to cater for validity of your data, avoiding bias?

**(EV269/STD) TBO:** Yah that is one of the parts which I think they have been challenging to me because I was using a self-administered questionnaire where people fill in their opinions and it is possible that they may fill what you – you they assume you wish to find, or they may fill only about positive things which makes them more acceptable, you can say that, so uh so as I was using a questionnaire, the validity part – the questionnaire I had to use should be valid. I had validated the questionnaire.

**(EV270/STD) SM:** How?

**(EV271/STD) TBO:** I gave the questionnaire – in fact the questionnaire is not completely original as I have stated. It has been used before by someone in another study in the past so I tried to change it to fit it into my context. To change the wording and some of the items in the questionnaire, then after that I took the questionnaire and gave it to the stakeholders in science education. By stakeholders I mean people like the Inspector for science, Science Education Advisors in Lesotho, Examiners in Science, Curriculum Developers of Science, and about, and some Science Teaching Makers, Subject Makers I am trying to say that. So the total of those people they were 67 of those people I sent questionnaires to them. So the purpose of that part before I admitted the questionnaire was to validate it. First of all to look at if the questionnaire was very clear, it was not ambiguous, did I've terms in the questionnaire were not ambiguous, they'll be clear to the teachers, that is what I did.

**(EV272/STD) SM:** So you run a pilot?

**(EV273/STD) TBO:** That is – that was my pilot actually; it was a kind of a pilot but in the form of validating the questionnaire. Then after they had to write where I had to change and so on, comment on the instructions, comment on some items: this one is not necessary it's not related with what we're doing and so on. So at the end they give them back to me, I modify the questionnaire based on what they have commented, so it developed the questionnaire, after that I – I administered the questionnaire among about ten (10) teachers to fill it up and to give some comments how they feel when they were completing it and to tell me the time they have taken to complete it. They gave it back they said it was fine except that it was a little bit longer. They gave me the feedback that it was ok.

**(EV274/STD) SM:** On compiling your questionnaire, what resources did you use? Or what, you said you got it from, you reused and then modified one, besides that, besides that, where did you get=

**(EV275/STD) TBO:** =One of the thing which helped me to develop my questionnaire is literature review, after a lot of literature review in the area you're researching you become aware about – about the...what things you have to include in your research, which will answer your research questions and address your objectives. So have to, you try to include those items which will answer you or respond to your objectives. So that is why I think I found out that literature review is one of the pillars of a successful research. So that's what happened.

**(EV276/STD) SM:** Ok, um you'll notice that when someone is conducting research, they cannot do it in isolation. You find that you rely on other resources, other people, etc. You can look at that as a research community, where you have resources and have people whom you go to, were you able to rely on other people and resources?

**(EV277/STD) TBO:** Yah, yes, there were three or four people that who were the same level where we used sometimes we used to meet and discuss ideas about our researches, and that was actually very helpful, I remember also that I also exchanged the questionnaires with some of my colleagues the questions I was going to ask. One thing which I did not mention during the validation process of my questionnaire, I also conducted focus group interviews whereby we were discussing with small group

of teachers about the questionnaire: we talked about it, DISCUSSED IT IN DETAIL, yah, actually we scrutinised the questionnaire. um, sharing, after they have already filled it, others had filled it.

**(EV278/STD) SM:** How was the outcome of that process?

**(EV279/STD) TBO:** Yah they also provided insights on how to make the questionnaire more – I think more valid, so at the end the final draft questionnaire I tried to include everything said and eliminated those which might not be necessary, that was as far as I can make in validation. SO by sharing ideas with people, my colleagues, my classmates that's what I can say, I did meet some of them, it was very helpful, always will come up with something which you've not been aware and that helps you to modify. In fact that's one of the things which I think if somehow they are sustained or it makes me very organised manner right from the beginning of the developing the research. It can make very good way of research.

**(EV280/STD) SM:** So would you say by interacting with other people, how was it helpful in your research, besides the questionnaire and other things which you had to deal with in your research?

**(EV281/STD) Tbo:** Yah, one of the other things that we – when we were discussing, particularly when we were discussing my research, I remember some of them they actually questioned me about the feasibility of the research, how possible is it that this kind of research as a large type research will go through. So those are the kind of things they were questioning, and by answering those questions I looked back critically on how that can help. So they kind of ask you questions which make you think more and more about how to make it a very good research, and yah that is actually what happened.

**(EV282/STD) SM:** So would you say they were valuable?

**(EV283/STD) Tbo:** Yah, they were actually valuable - helpful. So such kind of discussions are very valuable. In fact I don't think any research – even if its good, by interacting with other people I realise that it can, it can be even better than that. Yah, because ...yah that's what I think.

**(EV284/STD) SM:** Now, um, you find that when you are interacting there are some constraints, it could be time constraints, it could be distance, may be people you're interacting with, who may share information with you, are not in the same location. so how were you keeping these interactions?

**(EV285/STD) Tbo:** Yah it was difficult especially - but one of the things that I realised is internet was a lot of helping, I can say that. Uhh in some cases I was able to specifically send some messages to some of the people I need help from to ask some questions, some questions which where they can help about that, and they were able to give me, yah, sometimes positive feedback. Sometimes I' would write a text when I am not sure this is what is. I remember, for example, when I was still developing my research questions and objectives, the statement of the problem, such sections of the research, when I was not sure I send them to someone to scrutinise via the internet process, and that was very helpful.

**(EV286/STD) SM:** Besides Internet what would you say another setup which could help?

**(EV287/STD) Tbo:** Yah, another setup which is quite helpful is this one of posting the questions. Yah, is this one posting the particular question that a had in internet and then some of my, the people whom we share the same, we are in the same area about research, uh they respond to that question, that was also very helpful, yah. It was very helpful, but what I have also realised is that it also depends on people's familiarity of the area you're dealing with.

**(EV288/STD) SM:** But if you looking at um, general research problems would you think it would be of help?

**(EV289/STD) Tbo:** That actually would be of really of help, especially what I have noted is from the feedback I got, we have different levels of understanding on how to go on about research. So some

of the feedback you get from the people about the questions you ask is very constructive, yah is very constructive which otherwise you' would just wonder how you obtained it. also I have noted that you get different viewpoints from different people and what you'll have to do is just to look at what you think it's valuable for your research, so that was actually very helpful, and another thing I think in that case I found quite a bit more helpful because you know sometimes when you're in discussions, face-to-face discussions, you may feel to, very body may.. Some people may not be able to respond to your question.

(EV290/STD) **SM:** They are shy?

(EV291/STD) **Tbo:** But what I have noted is that through that internet interaction, more people were able to respond than on maybe we were in face-to-face talk. So it was helpful since we work at different times, sometimes we're busy. For example I was collecting my data at home (Back in Lesotho), when you access the internet you find that the question you've asked you're able to access it to get some responses, and also read other's problems and response. So you realise that it was even more convenient in terms of time and space.

(EV292/STD) **SM:**

### Extract from KAR online tool

Research Challenges

Posted Sun, 08/01/2010 - 14:30 by [Mlas](#)

(EV293/STD) I am doing a research that investigates learning by participants in a research community, and how use of an online knowledge research repository with research repertoire developed by the research community can scaffold learning. The research uses a qualitative methodology. I have been battling with mainly two challenges, with a third one in the pipe line. My supervisor and a peer research group have been helpful in lessening the burden but:

Challenge I:

(EV294/STD) It took me months to come up with a focused Research Question (RQ) [which by the way is still being refocused] and a Research Topic (RT). I had an idea of what I wanted to do but formulating the RT & RQ has been an up-hill task for me. Even now, I occasionally edit the RT after some readings or after adding one or two paragraphs in the report. That is the first challenge.

Challenge II:

(EV295/STD) The second challenge is related to the first in a way. I must have tried several theories to try and locate my research, I think at this point I have written and overhauled my literature review three times. Each time reading totally different theorist: I moved from Activity Theory, to Jurgen Habermas's theory of Communicative action, Hermeneutics, to Knowledge, (tacit & explicit) creation theories, Engestrom's expansive theory and Wenger's communities of practice.

(EV296/STD) My question is how does one settle these challenges without straying as I did? What resources should one use? In other words what resources should be at one's disposal to ease these and other research hurdles? What knowledge is needed and how does one use that knowledge efficiently without loosing valuable time? What need to be done right? Anyone, how have you been dealing with your challenges?

["Puzzlement" when doing research: The Dangers of using many theories](#)

[« Teaching students research processes up "Puzzlement" when doing research: The Dangers of using many theories »](#)



Comments

[Research Challenges](#)

by [Mlas](#) - 11/09/2010 - 15:08

**(EV297/STD)** I agree, doing a good literature review has helped me to focus on what I want to do and out of that, I have managed to come up with a conceptual framework or model for my research. Well it may not be the best of models but I realise that with some form of a structure, in this case a concept, that guides you, you tend to remain on track and it helps in excluding the extra load that is not related to what you want to achieve.

**(EV298/STD)** Another challenge that crops up though is knowing how to create those "punch lines" that succinctly describes your research. Putting it in the most clearest non-ambiguous and acceptable words. This is one experience I still have to master. I tend to wind about not nailing it. I always start from the general then try to state the problems. The reasoning behind this is that I will be building the picture to the reader. Somehow this may not be the best approach when writing a paper. What do others say on this one?

[reply](#)

[Referencing own work](#)

by [Taka](#) - 10/17/2010 - 22:12

**(EV299/STD)** How much of your previous work are you allowed to quote. When you author and co-author conference and journal papers, the work is not yours alone but when you are working on your own thesis you then need to reference to that work. Does this amount to plagiarism?

[reply](#)

[Looking for VCoPs in Western Cape](#)

by [Herm](#) - 09/01/2010 - 19:01

**(EV300/STD)** Hi all, thanks for creating this site for sharing research knowledge...I am doing my research on virtual communities of practice (VCoPs)...To make it short, I am looking for some VCoPs in Western cape (preferably) in the education sector where I can test some models on them...Anybody with such information. Please contact me via my e-mail 201083922@cput.ac.za or ogbamichaelh@cput.ac.za

Your sharing will be highly appreciated...

Herm

[reply](#)

[Discussion](#)

by [DN](#) - 08/06/2010 - 17:50

**(EV301/SUP)** Thanks for sharing these research challenges. These go to confirm that research is a process to find answers to unstructured problems. There is no one way of resolving the problem of settling on a research topic other than having a clear understanding of the phenomenon of interest and clarity on the aspect of the phenomenon that puzzle a researcher. It is this 'puzzlement' that leads to a research question. A theory is both to help you conceptualize and also serves as a framework in which to anchor the concepts or constructs. This means that all the theories that you explored would help you to conceptualize differently and see the problem differently. Another role of theory is to create a

shared understanding of the research problem between you the researcher, and other researchers who will engage with your work.

**(EV302/SUP)** To this end, I am extending an invite to researchers to share their own research project examples on how they went about settling on a research topic, asking the research question and what processes they followed to choose a theory.

[reply](#)

[My opinion on selecting](#)

by [Herm](#) - 09/01/2010 - 19:07

**(EV303/STD)** My opinion on selecting theories is: first read and read as many literature as possible but be focused on what research question that you are trying to tackle. If there are too many theories, be satisfied with the utmost best theories that are suggested by many previous literature but that addresses the research question that you are trying to resolve. Even if you come up with final thesis, research is an ongoing process...constructing and deconstructing theories and practices...thus, be focused on the research problem and questions that you are trying to address...  
Herm

[reply](#)

Plagiarising or not: How is this treated?

Posted Sun, 08/29/2010 - 15:43 by [Mlas](#)

**(EV304/STD)** Today (29 Aug 2010) as I went by searching for articles as usually the case when doing research, I came across an article that was written by Martins et al, in 1998, titled "A remote knowledge system for teaching and learning". On reading the article, I noticed that some of the sentences or phrases to be more specific were in more ways similar to what I had written weeks back and handed to my supervisor. Now these days there are tools to check a document for plagiarism and if used on my article, chances are my paper may be condemned for plagiarism.

**(EV305/STD)** So, how is this treated in academia when I honestly did not know the existence of such a previous paper but the articles I read led me to paraphrase leading into the similarities?

["Puzzlement" when doing research: The Dangers of using many theories up Research Challenges](#)

Comments

[Plagiarising unknowingly](#)

by [Taka](#) - 09/19/2010 - 15:19

**(EV306/STD)** In law they say ignorance is not an excuse. Similarly, in academic circles its expected of you to have a thorough check and analysis of issues before you claim authority. With the help of the softwares now available to assess plagiarism, it must be easy for researchers to evaluate their content with minimum effort.

[reply](#)

"Puzzlement" when doing research: The Dangers of using many theories

Posted Sat, 08/14/2010 - 14:29 by [Mlas](#)

**(EV307/STD)** Attached is a 3 minute audio that was recorded in one of our research peer group meetings. Highlighted in the discussion is one viewpoint on using many theories.

[Plagiarising or not: How is this treated? up Responsible Conduct Research](#)

**(EV308/STD)** Responsible Conduct Research

Posted Thu, 08/12/2010 - 11:56 by [sdonnelly](#)

**(EV309/KR)** One of the challenges facing researchers in general and those that involve human subjects in particular, is balancing the quest for new knowledge and managing the research process responsibly. The notion of what constitutes an irresponsible conduct of research is usually misunderstood and this potentially leads to inadvertent mismanagement of a research process. This seminar will unravel the notion of 'irresponsible conduct in research' in broad terms, and specifically deal with the issues of authorship, address why a good awareness of the need for reflection on ethical matters in regard to research is part of the route to excellence in research.

**(EV310/KR)** This podcast originates from a seminar presented by Anne Pope, Interim Director of the Office of Research Integrity at UCT, entitled "Responsible Conduct in Research".

[Research Challenges up Clearly Stating the Research Problem](#)

Clearly Stating the Research Problem

Posted Sun, 11/21/2010 - 22:49 by [Mlas](#)

**(EV311/STD)** I have been having big research issues; one of them has been of succinctly stating my research problem and explaining its importance in the research. Then the Purpose of research and the research questions should ideally flow easily from there. I got hold of J.W. Creswell, 2008 & started reading it this weekend. It is clarifying some of the issues I have been struggling with for quite some time. I wish I got hold of these material months back. One of the problems that I have discovered with myself as I do my research is that I stutter each time someone asks me what my research is all about; it is difficult to explain to someone. Because of that it has been even more problematic to ask for help from other people. Like how do you ask for help when you can't explain your problem? Anyway, the good thing about my new discovery is that the book was suggested by a peer after I told him about my struggles of finding stability in my research. There must be a dozen more articles even better than Creswell, I hope for a repeat as soon as possible as my research time is fast running out.

[Responsible Conduct Research up Data Collection: Access to, and Availability of Purposive Sample](#)

Data Collection: Access to, and Availability of Purposive Sample

Posted Tue, 09/07/2010 - 15:25 by [Eshi](#)

**(EV312/STD)** I am exploring use of ICTs by Distinguished Teachers (DTs) at UCT. My targets or samples are Distinguished Teachers, thus, sampling was purposive. Having purposive samples is in one hand good because you know exactly who to look for and probably where to find her or him; but on the other hand, it is challenging when it comes to their access and availability. From my experiences, you have to think ahead on how you are going to contact your samples and get hold of them, regardless of the research methodology you are using. In my case, I have to interview them; therefore, I had to request for an appointment for the interviews. I would like to share a bit of the challenges I faced with getting hold of my purposive samples – DTs.

**(EV313/STD)** To get hold of DTs for an appointment for the interview, I faced two challenges: first, getting access to them to request for an appointment for the interview; second, their availability for the interview. Getting appointments was a bit problematic. To request for an appointment, I had two approaches in mind: the first one was to stop by their offices and request for an appointment physically; and the second one was to send out interview invite letter by e-mail. The first approach didn't work out well as I had to walking up and down given the fact that DTs come from different faculties and departments at UCT, and the size of the campus – UCT; yet to find out that the person I am looking for is not in the office for various reasons. The second approach, I had to secure their e-mail addresses. Getting their e-mail addresses was quite easy, be it by getting them from their secretaries in the offices I managed to go to, or by getting them from the staff directory on the university's web site. But even the second approach was not that fruitful – still their access and availability was still a problem. Most of them were out of the country attending conferences, others on sabbatical leave. I can't say this would always be the case for every purposive samples – my experience could be attributed to the context of my research where my samples are lectures; thus, their working environment dictates their availability – encompass them in various activities like attending conferences, either within the country or abroad. That is to say, in other context it may be different from my experience.

**(EV314/STD)** To conclude, samples' access and availability should not be taken for granted; their availability doesn't mean their accessibility vice-versa. This is because their access and availability could derail, and change the project time-line! If I happen to use the same methodology in the future, I will do it differently.

[◀ Clearly Stating the Research Problem up Navigating the Literature Review ▶](#)

Comments

[response](#)

by [PRam](#) - 09/23/2010 - 10:53

**(EV315/KR)** Each research involving human subjects is characterised by a manifold of problems as you are researching people who have other commitments and responsibilities. All the same, you could have tried sending an online questionnaire or dropping the semi structured in-depth questionnaire in their pigeon holes. Either ways, you needed to be persistent in the follow-up to ensure that they are filled in. This is because generally speaking, online surveys involving questionnaires have a low response rate. Though as it may, they are worth trying as well.

**(EV316/KR)** The other option for lecturers who are adept with technology could be to use adobe connect (some sort of web conferencing) where you could talk to your respondents live and they could respond from the comfort of their offices, and a podcast would be developed as the conversation goes or at the end of the conversation. (See your course convenor for details on this). It would be useful to mention some of these research challenges in your research limitations.

[reply](#)

[Sample Access: Adequate Data](#)

by [Mlas](#) - 09/07/2010 - 19:39

**(EV317/STD)** I want to say I somehow can relate with your experience in somewhat related way. It all boils down to getting “adequate” data, enough for reasonable analysis. I am researching on the use of a virtual website tool to scaffold or mediate the research processes learning and knowledge creation. My initial methodology has been to invite participants to become members of the virtual research community where they interact through the website, exchanging research ideas and from these activities learn and contribute to the success of their research study. Once ‘adequate’ interaction data accumulated, I would use this in addition to semi-structured individual interviews as my data.

**(EV318/STD)** Now the challenge is that the activity on the website has been low, and this has necessitated a rethink on the approach.

**(EV319/STD)** So, yes, plans will not always work out as expected, I guess this is part of doing research. Through supervisors, colleagues and others, and through interpreting the situation on the ground, the initial methodology should be fluid, we should be able to devise new methods that will produce expected results.

[reply](#)

Navigating the Literature Review

Posted Mon, 09/27/2010 - 13:57 by [Mic](#)

**(EV320/STD)** I am currently working my through the literature review for my dissertation. I find it challenging to determine when one can say the literature review is complete. There seems to be so many different directions and angles that one can take within the literature. Naturally it needs to be as tight and succinct as possible. A good Literature Review survival guide would be helpful.  
Thanks

[Reply 1: Navigating the Literature Review](#)

[Reply 2: Navigating the Literature Review](#)

[Reply 3: Navigating the Literature Review](#)

[Data Collection: Access to, and Availability of Purposive Sample up Reply 1: Navigating the Literature Review](#)

Comments

[Navigating the Literature Review](#)

by [Mlas](#) - 11/01/2010 - 12:23

**(EV321/SUP)** The answer to this student's question is: it depends. The supervisor is the only person who can know what it depends on, and so the supervisor should be answering this question.  
Hther

[reply](#)

[Knowing when to stop](#)

by [DN](#) - 09/28/2010 - 13:26

**(EV322/SUP)** You might find Levy and Ellis' (2006) ideas on how to tell when you're done with the literature search useful. See their paper here: <http://tiny.cc/qu22o>  
Hope this helps.

[reply](#)

[Response](#)

by [PRam](#) - 09/27/2010 - 15:02

**(EV323/KR)** It's normal to have different angles on the phenomenon emerging from the literature review but if you are not careful the process might never seem to end. What becomes important is to have a self evaluation process where you should ask yourself the following questions:

- (EV324/KR)**
1. Have all the leading researchers on the topic discussed been adequately engaged with in a succinct and convincing way.
  2. Are all the main arguments that anchor the study sufficiently discussed and synthesised with a view to expose the different facets through which the research problem manifests itself.
  3. Are arguments and counter arguments presented in a powerful and convincing way that informs the reader about the assumptions the writer has about the research (what he thinks is going on here)
  4. Has the literature review provided critical readers with deep insights into the matter investigated with possibilities for preventing *cau de sacs* (dead ends)
  5. Has the literature review provided sufficient grounds that want investigation of the phenomenon (why should we care question) .
  6. Lastly, literature review only ends after you convince the reader that you have a convincing solution for or express a strong commitment to solving the problem at hand

[reply](#)

Reply 1: Navigating the Literature Review

Posted Mon, 09/27/2010 - 19:47 by [Taka](#)

**(EV325/STD)** Literature review is on-going as you will see that once you choose your area of study, you will still find new and old information to support your topic. But the approach you use, must guide you especially if you use the sub-research question approach, where you analyse one question after the other. You should try to exhaust in terms of what literature is available concerning your area, who are the authoritative authors, "gurus", and what do they say and what is missing that you want to address. once you address these points then your literature review is fine. The other guide is the number of words which you can get from some previously supervised thesis by your supervisor or a direct inquiry from him.

[◀ Navigating the Literature Review up Reply 2: Navigating the Literature Review ▶](#)

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Comments

[Thank you Taka for adding](#)

by [Mic](#) - 11/15/2010 - 13:23

**(EV326/STD)** Thank you Taka for adding your comments. I think you have suggested a very good strategy of aligning ones research questions to the literature. I will focus on identifying the authoritative researchers around each of my sub research questions and documenting their investigations into each. Thanks for your assistance!

[reply](#)

[Navigating the Literature Review](#)

by [Mlas](#) - 11/20/2010 - 18:34

**(EV327/STD)** My problem was in the formulation of a research question and its sub questions. I think by coming up with focused questions early may help in setting boundaries of one's literature review and getting the 'gurus' work. But again as I read around the topic, I found myself having to continuously change the wording of my questions and even the title, I ended up in a vicious circle within the topic I am researching, its like as I read I re-discover new knowledge and the ideas I had evolve and to accommodate the new discoveries, I have had to rework part of my literature. It seems this will continue until I hand in the report. I wonder if this is normal.

[‹ Reply 2: Navigating the Literature Review up Question: Data Analysis Dilemma - Need Help ›](#)

Question: Data Analysis Dilemma - Need Help

Posted Sun, 08/15/2010 - 23:24 by [Mlas](#)

**(EV328/STD)** Attached is a data analysis dilemma from a student doing research. His data is both qualitative and quantitative. To assist, please post either a Video, Audio or Text response. Thank you.

[Combining the methods](#)

[Reply 1: Working with both Qualitative and Quantitative Data](#)

[Reply 2: Qualitative & Quantitative Methods](#)

[Reporting both quantitative and qualitative data in the thesis](#)

[‹ Reply 3: Navigating the Literature Review up Combining the methods ›](#)

Comments

[Combining qualitative and quantitative analysis methods](#)

by [Paki](#) - 11/08/2010 - 13:08

**(EV329/STD)** I am doing a qualitative study and it is supplemented by quantitative data, so all I am saying is that I agree with colleagues that the analysis can be done in combination in order to effectively answer your research question(s). But, as colleagues have pointed, it is important to always bear in mind the topic and your research question(s) and/or objective(s). Another catch would be to dwell more into principles that do not mainly form part of your study, for example in my case I should not dwell much into the quantitative aspects because those just have to supplement results got from the qualitative analysis, so this says one should decide on the mixed methods design to use so that a combined analysis is not a mess. Perhaps you could look into the these mixed methods designs and read more about them (1) Explanatory mixed methods design (2) Exploratory mixed methods design (3) Triangulation mixed methods design and (4) Embedded mixed methods design.

[reply](#)

Combining the methods

Posted Thu, 11/11/2010 - 11:46 by [Paki](#)

**(EV330/STD)** Repeat post §0

[‹ Question: Data Analysis Dilemma - Need Help up Reply 1: Working with both Qualitative and Quantitative Data ›](#)

Reply 1: Working with both Qualitative and Quantitative Data

Posted Wed, 09/08/2010 - 10:30 by [Mlas](#)

**(EV331/STD)** The following attached audio is a discussion that ensued in our Research Peer Group Tuesday meetings. The discussion may help answer the question in the audio above. Please listen and comment or pose further questions that emerge as a result

**(EV332/STD)** The meeting was based on a presentation on Qualitative and Quantitative Data gathering and Analysis. A full version audio of the meeting is available on request. The first presentation was an overview; plans are underway to bring in another presenter to take the topic further as this has emerged as one of topical research issues in the Peer Group.

Attachment [Qualit Quantit Data&Analysis Ans1.mp3](#) 10.92 MB

[◀ Combining the methods up Reply 2: Qualitative & Quantitative Methods ▶](#)

Posted Sun, 09/19/2010 - 10:10 by [Mlas](#)

**(EV333/STD)** On use of both qualitative and quantitative methods: Linkages on these two methods are possible and you can combine them well in a 'multimethod design'. I refer you to:

Miles, M., & Huberman, A. (1994). An expanded sourcebook: Qualitative data analysis (2nd ed.). Thousand Oaks: SAGE, they discuss how, if one wants to use both, can design their research that includes both. One design they discuss is when a researcher does an initial 'exploratory fieldwork' collecting qualitative data that can later be used to come up with quantitative instruments such as questionnaires.

**(EV334/STD)** Have a look at the book, it may help you, I am still on it and it gives good insights for us newcomers to research.

[◀ Reply 1: Working with both Qualitative and Quantitative Data up Reporting both quantitative and qualitative data in the thesis ▶](#)

Posted Sun, 09/19/2010 - 15:11 by [Tibo](#)

**(EV335/STD)** I posed my problem to mobile dfaq earlier on about how to merge qualitative and quantitative data in the research report. I am thankful for quite useful responses from the other postgraduate students.

**(EV336/STD)** Most of the answers they provided answered my question right away. One very useful aspect I noted is that the answers are consistent with the broad literature review on research as well as some samples of previous postgraduate students reports I have read.

**(EV337/STD)** In particular, I noted that most the empirical research reports which incorporate both quantitative and qualitative divide the chapter on analysis of the data into two major sections; one for quantitative data and the other for qualitative data. As one of the contributors indicated, it appears like most research reports use one form of data to verify the findings reported in other form the data. I think this is one helpful way of reporting the data. Moreover one form of data can also be used to answer a particular research question rather than supplementing another other type of data.

**(EV338/STD)** I really like the idea that what matters most is using the data to address the objectives of the question in the best possible approach. So as one contributor stated, framework of data analysis and research questions must be key instruments in guiding one on how best to report both forms of data.

[◀ Reply 2: Qualitative & Quantitative Methods up Question: Including Quantitative data analysis when initial proposal was based on Qualitative method ▶](#)



Comments

[response](#)

by [PRam](#) - 09/23/2010 - 10:35

**(EV339/STD)** The issue of combining qualitative and quantitative methods is common in research projects and we have addressed it in our informal peer group meeting. Think about the following questions when addressing it your thesis structure:

1. What issues do your research question seek to address? If research data is presented quantitatively (rather than qualitatively) what value could that add to the overall argument and contribution of the thesis? The normal is to present quantitative details and then distil the implications of the quantitative data qualitatively.

**(EV340/STD)** 2. What do you want to demonstrate and prove with the qualitative and quantitative data?

Quantitative data is often useful for demonstrating the frequency of occurrence or incidences of phenomena, while the qualitative data seeks to present the inter-subjective, non-quantifiable details like the perceptions, views, perceptions and beliefs of respondents about phenomena. What you want to demonstrate should therefore guide you with regard the appropriate form of data to use. This definitely will be informed by your objectives

3. What are the epistemological foundations that guide the thesis? Each epistemological stance takes you closer to the right methods of investigating the phenomena. Ensure that the methods (quantitative and qualitative) suit the phenomena to be investigated and are informed by the epistemological stance adopted.

[reply](#)

Question: Including Quantitative data analysis when initial proposal was based on Qualitative method

Posted Mon, 08/23/2010 - 21:26 by Mlas

**(EV341/STD)** I need to know if it's possible that from my research proposal that is purely qualitative, can I then change and encompass or include some quantitative aspect on the thesis itself?

**(EV342/STD)** An audio version of the question by the research student is attached. Your feedback is appreciated

[Including quantitative method on a purely qualitative research](#)

[◀ Reporting both quantitative and qualitative data in the thesis up including quantitative method on a purely qualitative research ▶](#)

Comments

[Including quantitative in a qualitative based method](#)

by [Taka](#) - 09/15/2010 - 20:43

**(EV343/STD)** The challenge is to re-introduce a sub-research question that was removed before the proposal was accepted by the High Degrees Committee. The approach being used is the one of dealing with one sub-research question after the other. Is the relationship between the research proposal and the thesis that follows so strict that you cannot change the proposed methodology?

[reply](#)

[Using of triangulation of method](#)

by [DN](#) - 09/01/2010 - 12:39

**(EV344/SUP)** The use of a triangulation of methods is increasingly common and there are many reasons for supporting the use of more than one method. Needless to say, it is often easier to include qualitative data in a quantitative study rather than the other way round. Usually quantitative methods use statistical analysis and this would have been collected from surveys or questionnaires etc, yet qualitative methods would predominately involve observations, interviews, focus groups etc. While the general answer to your question is yes, the general methodological approach to make this work well needs to be argued.

[reply](#)

[Data analysis dilemma](#)

by [PRam](#) - 08/25/2010 - 09:54

**(EV345/KR)** Look [Name hidden], it is very possible to have an overall qualitative study with quantitative elements in the data analysis section. What is important is to ensure that the methodological stance brings in the quantitative aspects upfront to ensure that they do not come as a surprise when addressed in data analysis section of the study. Remember a methodology embodies a demonstration the "fitness of purpose" of the methodological process, procedures and tools employed to examine phenomena. As such, providing a small section in the epistemology, design and sampling process on the partly quantitative slant of the project could be useful in alerting the critical reader to the quantitative aspects addressed in the analysis and findings of the work. By the same token, some quantitative studies can have qualitative elements- for example, the interpretation of the results and the discussion sections. More importantly, provide hunches in appropriate sections of the methodology on the significance of those quantitative elements, that is, what do they demonstrate in the study.

[reply](#)

Including quantitative method on a purely qualitative research

Posted Sun, 09/19/2010 - 22:31 by [Taka](#)

**(EV346/STD)** The situation is like the proposal registered with the High Degrees Committee, is purely qualitative and before I registered my proposal, I had this sub-research question which had the quantitative aspect removed by my reviewers. I still feel that this sub-research question can be incorporated back to help my research. The question is on how strict it is on the relationship between the proposal and the thesis that follows.

[◁ Question: Including Quantitative data analysis when initial proposal was based on Qualitative method up Research Experiences ▷](#)

Posted Sun, 09/26/2010 - 14:29 by [Mla](#)

**(EV347/STD)** I now appreciate that the learning curve is steep when doing research at this level (Masters). It is stressing but interesting I must say. For me I think even more steep is the learning curve as my first degree was in the applied sciences, computer science to be specific, and now my master's is in humanities. This is a big leap, I think. I have had to be introduced to so many of the social sciences theories and it's been like being hit by a Goods Train, on the other hand I must hasten to say the journey has been enriching and there is no regret at all. The creation of a Research Peer group is one blessing that came at the right time. The guys who have been attending our meetings on a regular basis have shared invaluable knowledge that has in a way helped shape my research. With theirs and the supervisor's inputs, I have been able to redirect and refocus my research steering, hopefully to the desired end.

I have, and still am, learning a lot which I hope will benefit the communities that surround me wherever I will be in the next few years to come. One other thing I have learnt is that research is a community endeavour, we may be doing separate study topics but we rely on peers, scholars, and other knowledge sources for support.

[◀ Including quantitative method on a purely qualitative research up The challenge of developing an academic](#)

The challenge of developing an academic voice

Posted Thu, 08/19/2010 - 13:28 by [PRam](#)

**(EV348/KR)** While academic voice is often conceived as a central concept in the advancement of the frontiers of knowledge, both emerging academics and students are often challenged with regard to the expressing their thoughts, ideas and perspectives. Although fostering a critical voice is fundamental to bringing new epistemic positions in academia, the fact that voluminous literature has developed on a subject or issue often constrains students and academics from transcending what is currently known. The question is always: What is new in what i am saying? Will this not be a cliché? Yet using established literature as leverages for making a solid argument should be embraced as one among the several ways of nurturing a reflective and critical academic voice. I provide some of the important tips for nurturing a critical academic voice.

- (EV349/KR)**
1. Immerse yourself in the literature on an issue or subject before you can start thinking about what your contribution towards that could be.
  2. Understand the reasoning, contexts, interests ( or ideologies) and motivations that inform this body of literature or research.
  3. How can this literature be synthesised? what's seems to be missing/ not to add up? What are the areas of concurrence and divergence and what inform them?
  4. In light of this, what is the bigger picture on this issue /concept /issue and is this picture convincing and sufficiently defensible?
  5. Points of departure- How do i differ? what can i add? How can i extend this argument and is my interpretive schema appropriate?
  6. Be daring (though in an intellectual mode) in the expression of your argument

[◀ Research Experiences up](#)

[Finding academic voice](#)

by [DN](#) - 09/03/2010 - 13:46

**(EV350/SUP)** A very interesting posting on finding ones own voice. This is a common problem and the recent article by Potgieter and Smit (see details below) provides insight on how to overcome the challenge of maintaining an academic voice.

**(EV351/SUP)** Finding Academic Voice  
A Critical Narrative of Knowledge-Making and Discovery  
Ferdinand Potgieter  
North-West University, Potchefstroom, South Africa  
Brigitte Smit  
University of Johannesburg, South Africa  
Qualitative Inquiry  
Volume 15 Number 1 January 2009 214-228 © 2009 Sage Publications

**(EV352/SUP)** The narrative in this discussion article portrays the quest by two researchers to find their scholarly identity in their craft. The central issue in this narrative piece as design type of this inquiry is the space of knowledge crafting— distinguishing between adopted knowledge from the theories that sustain our thinking and the realities that they encounter in the research fields where knowledge grows in dynamic ecosystems that they wish to engage with and try to explicate and to understand. The central

conundrum or the academic puzzle in this narrative is thus that they receive mixed messages about the interface between them, the researchers, the presented empirical world, and the theories from which they have learned. They are not sure where or when they speak in their own voices or portray their own identities.

URL to the full article: <http://qix.sagepub.com/content/15/1/214.full.pdf+html>

[reply](#)

University of Cape Town

## Appendix C: Consent Form

**Study Topic:** *“Using social learning environments to leverage traditional supervision of research students: A Community of Practice Perspective”*

**Researcher’ Name:** Shepherd Mlambo, MPhil in ICT in Education student, University of Cape Town.

**Email Address:** shepherd.mlambo@uct.ac.za

**Aims of the Research:** The study investigated the extent to which social construction of knowledge helped novice researchers learn generic research processes as they interacted in a social learning research environment that provided space for learning and reflection. Further, the aim was to investigate the leveraging of traditional supervision by a social learning environment. An online tool was used as a learning environment to provide a context for the postgraduate student to conduct research. The research explored the extent to which these students learnt and shared research experiences in a social online learning environment in addition to the academic support that they got from their supervisors.

The results of this research will be included in my final research document

**Confidentiality** I pledge that the information you provide will not be used for any other purpose nor given to any other persons or organisations. The information will be analysed, at an aggregate level, together with other information gathered in the survey.

Should you have any questions or concerns, please contact me at 079 457 8412 or by email: [shepherd.mlambo@uct.ac.za](mailto:shepherd.mlambo@uct.ac.za). I thank you in advance for your time and consideration of this request.

Sincerely yours,

Shepherd Mlambo

---

**Please respond to the questions below:**

**Do you give permission to participate in this research?**

Yes: \_\_\_\_\_ No: \_\_\_\_\_

**Do you give permission for the interviews to be audio recorded?**

Yes: \_\_\_\_\_ No: \_\_\_\_\_

**Do you give permission for the online postings you make to be extracted and be used in an aggregate report?**

Yes: \_\_\_\_\_ No: \_\_\_\_\_

I, \_\_\_\_\_, consent to participate in MPhil research study conducted by  
Shepherd Mlambo. I have understood the nature of this study and wish to participate. I am not  
waiving any of my legal rights by signing this form. My signature below indicates my consent.

**Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

Participant

**Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

Researcher

---

University of Cape Town

## Sample Filled-in Consent Forms

**Consent Form**

**Study Topic:** *Using social learning environments to leverage traditional supervision of research students: A Community of Practice Perspective*

**Researcher's Name:** Shepherd Mlambo, MPhil in ICT in Education student, University of Cape Town.

**Email Address:** shepherd.mlambo@uct.ac.za / shep.mlambo@gmail.com

**Aims of the Research:** The study investigates the extent to which social construction of knowledge helps novice researchers learn generic research processes as they interacted in a social learning research environment that provides space for learning and reflection. Further, the aim is to investigate the leveraging of traditional supervision by social learning environments (SLEs). An online tool is used as a SLE to provide a context for the postgraduate students to conduct research. The research explores the extent to which these students learnt and share research experiences in a social online learning environment in addition to the academic support that they get from their supervisors.

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Should you have any questions or concerns, please contact me at 079 457 8412/083 665 1392 or by email: shepherd.mlambo@uct.ac.za/shep.mlambo@gmail.com. I thank you in advance for your time and consideration of this request.

Sincerely yours,

Shepherd Mlambo

Please respond to the questions below:

Do you give permission to participate in this research?

Yes: ☒ No: ☐

Do you give permission for the interviews to be audio recorded?

Yes: ☒ No: ☐

Do you give permission for the online postings you make to be extracted and be used in an aggregate report?

Yes: ☒ No: ☐

I, DR PATIENT RAMBE, consent to participate in the MPhil research study conducted by Shepherd Mlambo. I have understood the nature of this study and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

\*

Signature  
Participant

Date

August 7, 2010

Signature  
Researcher

Date

## Consent Form

**Study Topic:** *Using social learning environments to leverage traditional supervision of research students: A Community of Practice Perspective*

**Researcher's Name:** Shepherd Mlambo, MPhil in ICT in Education student, University of Cape Town.

**Email Address:** [shepherd.mlambo@uct.ac.za](mailto:shepherd.mlambo@uct.ac.za) / [shep.mlambo@gmail.com](mailto:shep.mlambo@gmail.com)

**Aims of the Research:** The study investigates the extent to which social construction of knowledge helps novice researchers learn generic research processes as they interacted in a social learning research environment that provides space for learning and reflection. Further, the aim is to investigate the leveraging of traditional supervision by social learning environments (SLEs). An online tool is used as a SLE to provide a context for the postgraduate students to conduct research. The research explores the extent to which these students learnt and share research experiences in a social online learning environment in addition to the academic support that they get from their supervisors.

The results of this research will be included in my final research document

**Confidentiality:** I pledge that the information you provide will not be used for any other purpose not given to any other persons or organisations. The information will be analysed, at an aggregate level, together with other information gathered in the survey.

Should you have any questions or concerns, please contact me at 079 457 8412/083 665 1392 or by email [shepherd.mlambo@uct.ac.za](mailto:shepherd.mlambo@uct.ac.za) / [shep.mlambo@gmail.com](mailto:shep.mlambo@gmail.com). I thank you in advance for your time and consideration of this request.

Sincerely yours,

Shepherd Mlambo

Please respond to the questions below:

Do you give permission to participate in this research?

Yes: ☒ No: ☐

Do you give permission for the interviews to be audio recorded?

Yes: ☒ No: ☐

Do you give permission for the online postings you make to be extracted and be used in an aggregate report?

Yes: ☒ No: ☐

I, Hermon B. Oghemichael, consent to participate in the MPhil research study conducted by Shepherd Mlambo. I have understood the nature of this study and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

\*   
Signature  
Participant

21/07/2010  
Date

\_\_\_\_\_  
Signature  
Researcher

\_\_\_\_\_  
Date